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RE-ENGINEERING GOVERNANCE; E-GOVERNMENT AS A TOOL FOR DECENTRALIZATION; GHANA AS A CASE STUDY

Gyaase, Patrick Ohemeng Kwadwo

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RE-ENGINEERING GOVERNANCE: E-GOVERNMENT AS A
TOOL FOR DECENTRALIZATION; GHANA AS A CASE STUDY

A Dissertation Submitted for the Award of PhD in Information
Technology

Patrick Kwadwo Ohemeng Gyaase

Supervisor: Morten Falch; PhD. Assoc. Prof.

THESIS TITLE:RE-ENGINEERING GOVERNANCE: E-GOVERNMENT AS A TOOL FOR DECENTRALIZATION; GHANA AS A CASE STUDY

NAME OF PHD STUDENT: PATRICK KWADWO OHEMENG GYAASE

NAME OF SUPERVISOR: ASSOCIATE PROFESSOR MORTEN FALCH

LIST OF PUBLICATIONS DURING PHD STUDIES (PUBLICATIONS WERE NOT DIRECLY USED IN THE THESIS)

1. **Gyaase, P. O. & Gyamfi, S. A. (2012):** Transparency, equity and accessibility to secondary education in Ghana through E-governance: Stakeholder perspectives of the computerised school selection and placement system (CSSPS) in Ghana. *International Journal of Basic Education*: vol.2, issue 2: pp. 104-116

2. **Takyi, Augustine, and Patrick Ohemeng Gyaase (2012)** "Enhancing Security of Online Payments: A Conceptual Model for a Robust E-Payment Protocol for E-Commerce." *Contemporary Research on E-business Technology and Strategy*. Springer Berlin Heidelberg, 2012. 232-239.

3. **Williams, Idongesit, Patrick Ohemeng Gyaase, and Morten Falch (2012)**. "Enhancing rural connectivity through an extended internet cafés business models." *ITS Conference Proceedings*, Bangkok 2012

4. **Patrick Ohemeng Kwadwo Gyaase, and Williams, Idongesit (2013),** "Self-Interest in Innovation Diffusion Decision Process: The Case of Extending Broadband Internet Services to Rural Areas of Ghana." *Zn Nr 763 EkonomiczneProblemyuslug NR 105* 2 (2013): 45-57.

5. **Patrick Ohemeng Gyaase and Augustine Takyi (2013);** Public Financing Of Broadband Internet Infrastructure in Ghana, Funding Options and Challenges. *Journal of Technology Management & Innovation* (In Editing)

Technical Papers

1. **Patrick Ohemeng Gyaase:** Preventing Failure and Ensuring success in ICT Projects. In e-Government Leadership Capacity Building: Seminar Manual, Ministry of Communication and National Information Technology Agency, June 2012, Accra, Ghana

2. **Patrick Ohemeng Gyaase:** Technological Developments that will Impact E-government Initiatives. In e-Government Leadership Capacity Building: Seminar Manual, Ministry of Communication and National Information Technology Agency,

June 2012, Accra, Ghana

3. **Patrick Ohemeng Gyaase:** The Role of ICT and E-government in National Development. In e-Government Leadership Capacity Building Seminar, Executive Briefing Manual. Ministry of Communication and National Information Technology Agency June 2012, Accra, Ghana.

This thesis has been submitted for assessment in partial fulfilment of the requirement for the PhD degree. The thesis is not based on the submitted or published scientific papers which are listed above. Parts of the papers are used directly or indirectly in the extended summary of the thesis. As part of the assessment, co-author statements have been made available to the assessment committee and are also available at the Faculty. The thesis is not in its present form acceptable for open publication but only in limited and closed circulation as copyright may not be ensured

ABSTRACT

This research was undertaken to study the diffusion of E-government as a tool for decentralization, using Ghana as a case study. E-governance has been credited with the potential of facilitating good governance in countries with an appreciable level of E-government maturity. The attention being given to E-governance by international and inter-governmental institutions such as the European Union, the World Bank and the African Union is a testimony to its benefits for governments, citizens both corporate and individuals and civil society organization. Increasingly, resources are being committed to the development of E-government in developing countries such as Ghana for the achievement of good governance. Decentralization has hitherto been the approach adopted to make government and its services accessible to the citizens, facilitate citizen participation and ensure accountability to the citizens. These are the same values espoused by E-government. This research therefore assesses the diffusion of E-government as a tool for decentralization in Ghana. The research was carried out using a mixed methods approach. The study is approached from four theoretical perspectives. Firstly, E-government is an innovation and its diffusion requires the study of innovation decision making process and diffusion strategies that ensures successful diffusion of innovation. Secondly, as a technological innovation the TOE framework for technological innovation diffusion was used to identify factors that influence technological innovation diffusion. Successful diffusion of any innovation depends on the adoption and institutionalization of this innovation by stakeholders if the benefits of such innovation are to be realized hence the review of stakeholder and institutional theories. These four theories formed the bases for a conceptual model christened, the Technological, Organizational, Political and Stakeholder (TOPS) model which has been developed to assess the E-readiness of local government departments and agencies for the diffusion of E-government. The constructs and predictor variables of the model were statistically validated using data collected from 43 Chief Information Officers (CIO) from both state and quasi-state institutions in Ghana. The validated TOPS model was used to assess the E-readiness of 63 local government departments and agencies. The result shows low level of E-readiness among these institutions. Access to information and communication technology is no longer the main determinant of the low level of E-readiness among the sample due to increased access to mobile technologies. The dominant problems are largely institutional and political. Qualitative data was used to assess the factors affecting the diffusion of e-government as a tool for decentralization and the results pointed to vendor and donor led diffusion as affecting E-government implementation. There is also the absence of convergence between the E-

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government, the decentralization policies and their implementation. The study recommended awareness creation among the citizenry, and stakeholder analysis for E-government programs to facilitate widespread adoption. Increased government commitment as well as reengineering the existing governance structure is also recommended as measures that can facilitate effective diffusion of E-government which has the huge potential of being a catalyst to the decentralization process with its associated benefits.

SUMMARY OF THESIS: DANISH

Emnet for denne afhandling er E-governance som et middel til decentralisering. E-governance og dets potentiale i forbindelse med reformer i den offentlige sektor er et område, der har været genstand for stigende opmærksomhed. Både nationale regeringer og internationale organisationer såsom EU, Verdensbanken og den Afrikanske Union, ser E-governance som en metode til at forbedre og effektivisere den offentlige sektor. Også i mange udviklingslande allokeres betydelige ressourcer til udvikling af E-governance. Øget tilgængelighed af offentlige serviceydelser gennem decentralisering er et andet emne med relevans for mange udviklingslande, og det er derfor oplagt at kombinere disse to emner ved at undersøge, hvordan E-governance kan bidrage til decentralisering og øget tilgængelighed af offentlige serviceydelser. Dette gøres ved at anvende Ghana som en konkret case.

Afhandlingen anvender fire forskellige teoretiske perspektiver:

1) Diffusionsteori
2) Technology-Organisation-Environment framework
3) Institutionel teori
4) Stakeholder analyse

Disse fire teorier danner udgangspunktet for udarbejdelsen af en konceptuel model – TOPS (Technological, Organisational, Political and Stakeholder), der kan anvendes til at evaluere offentlige institutioners e-parathed. Modellen er evalueret med data indsamlet fra 43 informanter fra både hel- og halvoffentlige institutioner. Modellen er herefter anvendt til en vurdering af e-paratheden i 63 forskellige lokale offentlige institutioner.

Analysen viser, at de lokale institutioner generelt har et lavt niveau for e-parathed, hvilket på kort sigt begrænser potentialet for implementering af E-governance på lokalt niveau. Som følge af den høje dækning med mobile tjenester, er det imidlertid ikke adgangen til kommunikationsnet, der er den primære begrænsende faktor. Begrænsninger findes primært på det politisk-organisatoriske niveau. Strategierne for implementering af e-government er i høj grad defineret af eksterne partnere såsom donorer og udstyrsleverandører med begrænset inddragelse af lokale aktører. Denne afhandling anbefaler derfor, at der skabes lokal opmærksomhed om de enkelte projekter, og at implementeringen defineres på baggrund af en stakeholderanalyse. Endvidere skal programmerne understøttes af en re-engineering, de tilhørende services og arbejdsprocesser. Dette vil facilitere en øget udbredelse af E-governance og være en katalysator for igangsættelsen af en decentraliseringsproces.

ACKNOWLEDGEMENT

There would not be enough space to name all who, in diverse ways contributed to the success of the work, and for that matter, my studies over the years. The list would be endless. It is therefore with profound appreciation that I express my gratitude to those who have contributed time, money and thoughts to this thesis. First I give thanks to Almighty God for making this possible; this PhD thesis; the fulfillment of a dream I never dreamt and I count it as a blessing.

A special mention must be made of Morten Falch, PhD, Associate Professor at CMI, Aalborg University, and my Supervisor for painstakingly supervising this thesis. His patience, critical comments, constructive suggestions and dinners in his house gave meaning to the ideas expressed in this thesis.

To my wife, Cynthia and my kids Elvis, Elsie, Lynnette Nana and Kofi who endured my long absence from home and dissipation of family financial resources in order for me to complete my studies, I say thank you and I love you as always. My sincere gratitude to parents Mr. and Mrs. Ohemeng for their prayer support and to my uncle, Col Rtd. Kwadwo Damoah for encouraging me always to strive for more academic laurels.

I would like to express my deepest gratitude to all the staff of The Center for Media and Information Technology (CMI) of Aalborg University, Copenhagen for their support and for making my stay in Denmark bearable. A special mention must be made of Anette Bysoe who has been a mother and a sister and the most competent Administrator I have ever come across and her family for always inviting me to their home.

I would like to express my deep gratitude to all the heads of institutions, who opened their doors for me, responded to my incessant questions and provided me with the necessary information for the successful completion of this thesis, I thank you all.

Finally to the "gang" of PhD students in CMI, it has been a pleasure knowing you and sharing places with you guys, and I will forever be grateful for your help and support. I have made some special friends along this journey whose names space would not permit to mention here, to them I say thank you.

DEDICATION

This thesis is dedicated to my wife Cynthia, my kids Elvis, Elsie, Lynnette Nana and Kofi. I Love You All.

DECLARATION

I, Patrick Ohemeng Gyaase, do hereby declare that this thesis has been written based on research undertaken by me since the approval of my study plan for the commencement of a PhD (Information Technology) study program. I further declare that this work has not been previously submitted, partly or wholly, for any academic award in any other institution. And that research ethics procedures were followed and any contributions made to this work, paid or pro-bono are duly acknowledged.

LISTS OF ABBREVIATIONS

ABBREVIATION	MEANING
ICT (s)	Information and Communication Technology (gies)
ICT4AD	ICT for Accelerated Development
G2C	Government to Citizens
G2B	Government to Business
G2G	Government to Government
TOPS	Technological, Organizational, Political and Stakeholders
BPR	Business Process Re-engineering
MMDAs	Metropolitan, Municipal and District Assemblies
TAM	Technology Acceptance Model
UTAUT	Unified Theory for Acceptance and Use of Technology
TOE	Technology-Organization-Environment
DOI	Diffusion of Innovation
DACF	District Assembly Common Fund
DA's	District Assemblies
MDA'S	Ministries, Departments and Agencies
RCC	Regional Coordinating Council
D/MCE	District/Municipal Chief Executive
SSC	Shared Service Center
NITA	National Information Technology Agency
GGEA	Ghana Government Enterprise Architecture
GICTeD	Ghana Information Technology Directorate
SPSS	Statistical Package for the Social Sciences

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CHAPTER 1

1   INTRODUCTION TO THE STUDY

1.1   Introduction

This chapter outlines the background to and explains of the core concepts used in the study. It gives the background to the research and the research questions and states the research questions, objectives of the research, the scope of research, the justification of the research and the research domain, ending the chapter with the organization of the study.

1.2   The Background of the Research

Governments worldwide have recognised that the transformation of traditional rigid bureaucratic government into E-government has become a strategic public policy option in recent times. In the developed countries, E-government has become a reality to a very large extent with the attendant benefits, but can the same be said of developing countries especially in Africa? (Heeks, 2002). Behind the fanciful success stories and slogans, just what is the true state of E-government in developing countries, especially in Sub-Saharan Africa?

One of the key strategic objectives of E-government is to promote efficiency and effectiveness by simplifying government operations and its interactions with itself, citizens and businesses and other stakeholders (Kitaw, 2006). The deployment and utilisation of information and communication technologies (ICTs) could connect all the stakeholders and support the processes and activities of governments (Abdallah & Fan, 2012). E-governance is thus an electronic means of supporting and stimulating good governance. The objectives of E-governance are therefore similar to other public sector reforms such as decentralization which are aimed at ensuring good governance (Holliday, 2002; Lucke, 2010).

For the developed countries, the idea of access to and interaction with government and its departments through one counter around the clock through the utilization of information and communications technology (ICT) is not unthinkable. The realization of this same level of efficiency and flexibility in developing countries could be through decentralization and the adoption of E-government (Lucke, 2010).

E-government is generally defined as the utilization of Information and Communication Technologies (ICTs) for the exercise of governance and government functions to engender efficiency and effectiveness and to transform the relationship between governments and their stakeholders (Holliday, 2002).

Given the leapfrogging opportunities available through modern technologies, developing countries cannot afford to ignore the potential benefits offered by Information and Communication Technologies (ICTs) for governance (Kraemer & King, 2003). E-government has, however, developed beyond its earlier technological deterministic agenda. The technologically deterministic view perceives the resultant transformation in government through E-government as technology driven (Gurbaxani, King, Kraemer, McFarlan, Raman, & Yap, 1990). E-government is now considered a socio-technical endeavour which requires changing business models and processes and the attitudes of the stakeholders. The technology thus offers the solutions in the quest for transforming the way government and its agencies operate using information and communications technology (Ebrahim & Irani, 2005).

Being "E-ready" and managing the transition from routinized bureaucratic government service provisioning as still pertains in many a developing country to E-governance would require adequate planning, concerted efforts and commitment on the part of governments and policy makers (Kitaw, 2006). Governments in the developing countries are therefore setting leading edge and challenging E-government visions for the advancement of their public service either as a response to globalisation or to satisfy some donor requirements (Ahn & Bretschneider, 2011)

E-government strategies have thus become indispensable elements in modernising governance. A number of developing countries are increasingly developing and establishing organizational structures that facilitate agility in the processes of interacting with citizens and businesses through E-government. These are aimed at facilitating a reduction in cost and layers of the business processes of government agencies and departments (Holliday, 2002).

E-government enhances the development of strategic connections between government departments and agencies and ensures effective and seamless communication between all levels of government (Ho, 2008). Cooperation between government agencies and departments is thus improved while facilitating effective implementation of government strategies and policies through improved management of government processes, information and resources (Ebrahim & Irani, 2005). E-government could thus contribute significantly to the transformation of the Weberian government model; a bureaucracy emphasising departmentalization and routines as existing in many developing countries such as Ghana, into agile and responsive models of government (Irani, Elliman, & Jackson, 2007).

In the past, the chasm between the citizens and their government in the developing countries had been attributed to lack of communication channels, illiteracy and bureaucracy (Heeks, 2002). However, with increasing literacy levels, globalisation, technological advancements,

demand for effective citizen participation and interaction with their government as well as donor requirements, these governments are increasingly reinventing themselves to be more responsive, open and agile (Wong & Welch, 2004).

Information and Communication Technology (ICT) has become the key determinant of socio-economic transformation in the 21st century, consequently E-government reforms are becoming donor requirement and driven in the developing countries. Many an African country is thus faced with new challenges of re-engineering the processes of governance to enable the diffusion and adoption of E-government (Kitaw, 2006).

An increasing number of African governments are recognizing the potential of information and communication technology (ICT) to drive the acceleration of socio-economic development of their countries and also to meet the challenges of globalization and international standards (Kitaw, 2006). This has resulted in the formulation of national ICT policies and strategies to take advantage of the opportunities such modern technologies offer. For instance, there is an increasing availability of critical government information online; automation of administrative processes is taking place and the interactions with citizens through E-services are also on the increase (Lucke, 2010). However, these new technologies remain largely unexploited for decentralisation despite the great opportunities they provide (Edmiston, 2003).

Prior to the emergence of E-government, there have been various public sector reforms aimed at providing efficient and effective governance. Among such reforms are Decentralisation, Whole Government and New Public Management approaches to governance (Batley & Larbi, 2004; Christensen & Lægreid, 2007). Ghana adopted the District Assembly concept as an approach to decentralisation (Ahwoi, 2011).

This study therefore, seeks to unearth how the decentralization process is taking advantage of E-government to achieve its objectives and establish the relationship between these two governance approaches. To achieve these objectives, the E-readiness of the decentralised departments and agencies to deliver E-governance is assessed using an E-readiness assessment tool developed for this research. Assessing the E-readiness would help in identifying the prospects and challenges of E-government as an approach to decentralization in Ghana and make the necessary recommendation.

It is believed the conclusions drawn and recommendation made would be relevant to most developing countries where governments' quest to deliver E-governance is not meeting the desired expectations (Holliday, 2002). Governments in these countries are seeking to adopt

approaches that are citizen-driven and are aiming at reinventing government as has been done in the developed countries (Ho, 2008).

While an important goal of E-government is to improve citizens' lives by providing faster and more efficient services, there is a wider goal of increasing citizen participation in the process of governance and administration (Yun & Opheim, 2010). This study provides theoretical understanding to the implementation issues of E-government in developing countries such as Ghana and proposes the diffusion of E-government as an effective tool for decentralization.

1.3 Statement of Research Problem

Full and effective participation in the global information society is of critical importance if a country is to avoid marginalization from the globalized economy and attract its potential benefits (Fuchs, 2008). Modern information and communication technologies (ICT) are contributing to the integration of both developed and developing countries into the global economy through the creation of conditions for information and knowledge exchange and utilization (Eason, 2005).

ICT offers tremendous potential to raise standards of living and broaden opportunities for individuals, communities, countries and regions. Many parts of the world still remain directly unaffected by the information revolution despite the transformative effect they are already having on global society (Backus, 2001)

Governments have assumed greater responsibilities with the growing complexity and risks in managing social infrastructure. Systems for public health, environmental management, transportation regulation, telecommunications planning, and social services have all been impacted on by the rapid technological innovations and advancements (Misuraca, 2006). Governments are therefore looking to exploit the advantages of the technological revolution to serve their citizens better (Backus, 2001)

Taking advantage of these emerging technological innovations for public services delivery however requires governments to reengineer themselves and their institutions. Over the years various reforms aimed at ensuring good, open, responsive and participatory governance have been embarked on by governments (Calista & Melitski, 2007). Among such policies and strategies to bring governments and their services closer to the citizens are decentralization and local governance. Decentralisation refers to the central government formally ceding

powers to actors and institutions at lower levels in a political, administrative and territorial hierarchy (Antwi-Boasiako, 2010).

Ghana adopted the District Assembly (DA) system in 1987 under military rule and later enshrined it in the 1992 constitution as its approach to decentralization. This was in response to the need to ensure efficient and effective government services delivery and citizen participation in the governance process (Nkrumah, 2000; Crowford, 2004).

However, with the perceived benefits of E-government, governments in developing countries are under pressure from globalization, fiscal demands, evolving societies and citizen expectations as well as donor pressures to adopt E-government in response to social changes, to address public concerns, to address donor concerns and to manage public funds efficiently (Ho, 2008; Santiso, 2001).

It therefore came as no surprise that in 2003, the government of Ghana formulated and widely publicized the ICT for Accelerated Development (ICT4AD) policy aimed at transforming the country into an information-rich and knowledge-based economy (Dzidonu, 2003). These objectives were to be achieved through the development, deployment and utilization of ICT within the economy and the society as whole. One of the 14 key components of the policy is the development and promotion of E-government and E-governance (The Ghana ICT Policy for Acelerated Development (ICT4AD), 2003).

Governments throughout the world are confronted with the reality of the imperativeness of fundamental changes in the administrative structures and their interactions with citizens to promote good governance (Bhatnagar, 2003) occasioned by the developments in information and communication technologies. E-government diffusion ensures increased access to government by citizens thereby providing government with unique opportunities to improve governance and public sector management (Gil-Garcıa & Pardo, 2005; Bhatnagar, 2003).

With E-government, integration and consolidation of government systems are possible through digitisation to enhance greater efficiency and effectiveness. Governments thus diffuse E-government to become agile and responsive with commitments to transparency and accountability (Kim, Pan, & Pan, 2007).

Decentralised system of government also puts local departments and agencies at the forefront in the provision of government services at the local level. The question however, is how ready are these decentralised departments and agencies to diffuse E-government and deliver E-governance? What impact is E-government having on the decentralization process? How

can E-government be effectively diffused to reengineer governance so as to ensure effective and efficient service delivery and responsiveness of government in Ghana?

1.4   Research Questions

Determination of research questions is an extremely crucial step in the research process. The importance of research questions is to provide a clear research objective and justification for the study (Creswell, 2003; Roccoet al.,2003). Research questions therefore, reflect the problems that the researcher is undertaking to investigate. More specifically, research questions are interrogative statements that extend the statement of the purpose of the study to the particular questions that the researcher would like to answer (Onwuegbuzie & Leech , 2006). The basis of research questions can be theories, past research, previous experience, a puzzle, a new development in the society, a social problem, or the practical need to make data-driven decisions. They thus serve as signposts for the reader, encapsulating the specific details of the research (Creswell , 2003).

Research questions posed for this study thus provided the framework for the conduct of the study, aiding the organization of the research in terms of relevance, direction and coherence. The questions are clear indication of the limits of the research showing its boundaries clearly. The type of data collected for the study depended on the types of research questions the study sought to answer (Bryman, 2008).

The factors that influenced the selection of the research questions for this study are three;

 i.   There is increasing access to and use of information and communication technologies and allied services in the developing countries coupled with increasing literacy rate and middle income group among the citizenry (ITU, 2012).

 ii.   The private sectors in the developing countries are increasingly delivering e-services to the delight of their customers, and expectations for government services from citizens with the private sector experience are on the increase (ITU, 2013; ICT Facts and Figures, 2013).

 iii. Many citizens from developing countries have experienced E-government services in the advanced countries and are expecting similar services when they return to their respective countries.

The world is continuously experiencing new technology mediated public sector reforms known as E-governance (Ahn & Bretschneider, 2011). Developing countries, with the support of donor partners and other international agencies have developed ICT policies to re-engineer their economies and governance. The countries which have put in place the

necessary structures such as technological infrastructure, laws and institutional frameworks are the most likely to benefit more from this technologically mediated public sector reforms (Al-Omari & Al-Omari, 2006).

The availability of the necessary structures and strategies to take advantage of this technological revolution is often referred to as E-readiness. Ghana adopted an information and communication technology for accelerated development policy (ICT4AD) over a decade ago (Dzidonu, 2003). What is the progress made to strengthen governance and transform Ghana to a knowledge-based society by taking advantage of information and communication technologies?

The questions for this study therefore are;

i. What is the level of E-readiness of the decentralised departments and agencies for E-government diffusion?

ii. To what extent is E-government being employed in the decentralization process in Ghana?

iii. What are the factors influencing the diffusion of E-government as an approach for decentralisation in Ghana?

iv. To what extent is E-government diffusion impacting on decentralization in Ghana?

These questions were intended to facilitate the understanding of the diffusion of E-government as a tool for decentralisation to ensure agile, streamlined and efficient government service delivery.

1.5   Objectives of the Research

The literature on E-government often focuses on the organization of the front-office, and on the interaction between governmental agencies and citizens with some level of attention paid to the potential benefits and problems on implemention at the national level. However, little has been devoted to understanding why the problems of diffusion exist and the variation of these problems in different local government areas. This is the general objective of this study. Specifically this research is aimed at;

i. Assessing the appropriateness of available E-readiness measurements and proposing a framework for assessing E-readiness for E-government implementation in government institutions.

ii. Assessing the E-readiness of the decentralised departments for the implementation of E-government as a tool for decentralization.

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iii. Studying and analysing the E-government implementation in Ghana to determine its impact on the decentralisation process.

iv. Identifying and providing theoretical understandings of E-government as a tool for decentralisation in Ghana.

v. Making recommendations on the way forward for E-government implementation in Ghana.

1.6 Significance of the research

E-government facilitates varieties of services ranging from information dissemination, business transaction with the private sector and individual citizens to participatory democracy. The diffusion of E-government by both central and local government is motivated by the need to reduce administrative and operational costs, improve service delivery to citizens and businesses (Al-Wadhi & Morris, 2009).

E-government automates governance infrastructure and creates ubiquitous interactivity between government departments and agencies. It also facilitates government interaction with citizens through online access to information, ubiquity in transacting government businesses and communication with elected representatives in a relatively cheaper, quicker and efficient manner (Andersen & Henriksen, 2006; Edmiston , 2003).

The significance of this research lies in how it provides the local authorities, policy makers, governments and technology vendors, insights into the key issues affecting E-government diffusion especially at state, regional and local government levels. It would provide a framework for assessing E-readiness not only as an aggregate measurement of E-readiness but also to inform the strategy for implementing E-government in a particular local government area. It also measures the level of E-readiness of the districts and the decentralised agencies for E-government diffusion in Ghana. This would highlight the areas of deficiencies that would require attention for successful E-government diffusion as a tool for decentralisation. The study would therefore enable policy makers to hew out effective strategies for E-government diffusion in Ghana.

1.7 The Situation of the Study

This research is situated in the information system domain. The study defines information systems from both structural and functional perspectives. Information systems is therefore defined as the combination of processes and procedures, hardware and software, data sets and network infrastructure which users employ to facilitate the management and operations of organizations (Hunter, 2010).

The domain of information systems research has been categorised into three main perspectives of technology in organizations (Orlikowski & Iacono, 2001; Orlikowski & Barley, 2001). Early researchers in information technology in organizations approached it from a technologically deterministic view where technology is assumed to be an objective external force that possesses deterministic powers to alter organizational activities and structure (Orlikowski, 1992).

The second wave of research concentrated more on human aspects of technology in organization often referred to as socio-technical approach (Krishna & Walsham, 2005). The third wave combines the two approaches where technology is seen as an external factor with significant impact on organization; however such impacts are moderated by the humans and the organizational context (Orlikowski & Baroudi, 1991; Orlikowski, 1992).

This study is approached from the third perspective with the belief that although technology could facilitate changes in the governance in developing countries as evidenced in some developed ones, this would only be realised if technology is contextualised.

1.8 Scope of the Research

This research covers the factors determining the E-readiness of local government administrative departments and agencies. The concentration of the study in the local government areas is informed by the fact that a lot of attention has been devoted to the E-government at the national level. However governance does not only emanate from the national level only. Governance in various countries has been decentralised so as to make government services available to people in their local context.

The local government system facilitates local participation in governance and benefits from delivery of services by government departments and agencies which are closer to the beneficiaries. Hence, it is believed that E-government would achieve the optimum impact if it delivers participation and services at the local government areas through local institutions.

The study also concentrates on the factors influencing E-readiness and assesses the E-readiness of local government system for E-government diffusion. This would enable the identification of the factors affecting E-readiness for the diffusion of E-government by the implementing institutions. This would inform the diffusion and implementation strategies to adopt in response to the potential problems during implementation.

1.9 Organization of the Research

The organization of the research describes the number of chapters and offers brief descriptions of the content of each chapter. This thesis is organized into nine chapters. The brief descriptions of the chapters are presented below.
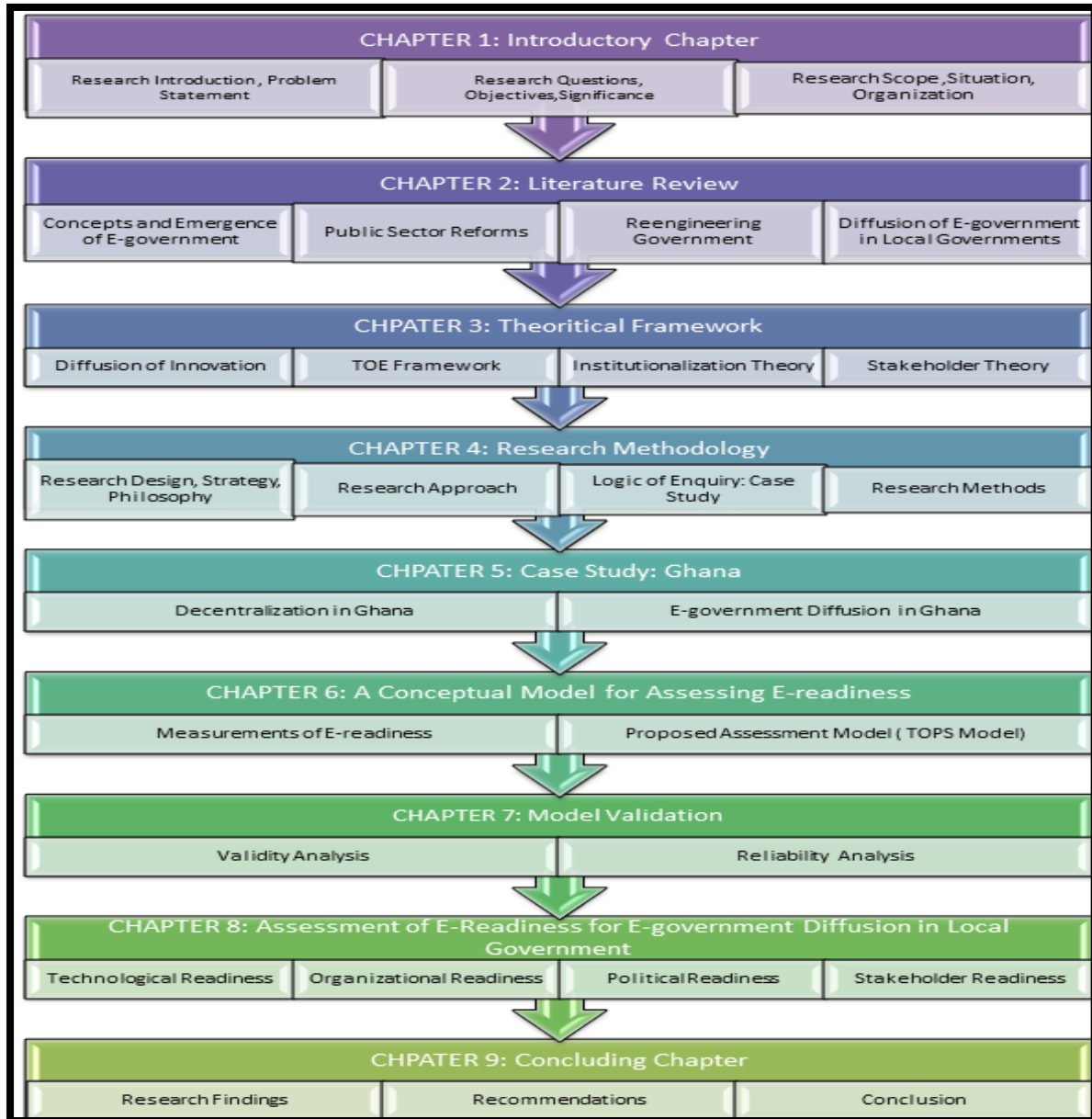
Figure 1-1: Research Organization

Chapter 1: This is the introductory Chapter which outlines the background to the study, statement of the research problem, research questions and significance of the research, situation of the research and scope of the research.

Chapter 2: This chapter covers the literature reviewed for the study. It begins with an extensive review of the concept of E-government, its classifications and models. It also

describes the various public sector reforms with specific emphasis on decentralization, types and the converging objectives of decentralization and E-governance. The Chapter further discusses re-engineering as a requirement for successful diffusion of E-government and the strategic framework for government systems re-engineering. The chapter concludes with a discussion on E-government in decentralization and the factors affecting the diffusion of E-government in local government systems.

Chapter 3: The chapter discusses the theoretical framework for this research. The four theories utilized in the study are reviewed in this chapter. The Diffusion of Innovation Theory (DOI) is discussed highlighting the types of innovation, innovation diffusion strategies and processes among others. The second theory reviewed is the Technology-Organization-Environmental (TOE) Framework for technological innovation diffusion in which the various technological, environmental and organizational factors influencing technological innovation diffusion in institutions are presented and discussed. The Institutional Theory which discusses the institutionalization of technology in organizations is also presented. The chapter concludes with Stakeholder Theory and Analysis with the discussion on types of organizational stakeholders and their influence on the institutions' innovation processes.

Chapter 4: This chapter covers the research methodology. The Chapter provides an overview of and the justification for the research design, research approach and the research philosophy. The chapter further describes the research methods used in the data collection and analysis. The chapter concludes with the ethical, validity and reliability, transferability and generalizability issues of the research.

Chapter 5: The chapter discusses the case under study. It provides a description of the decentralization and local government systems in Ghana. The emergence of E-government in Ghana and various institutional, strategies and legal framework are discussed. It further gives a brief description of the state of E-government and the value proposition of E-government for the local government system in Ghana.

Chapter 6: The conceptual framework for E-readiness Assessment (TOPS Model) used in the study is developed in this chapter. The conceptual model is supported with the theories used and extensive literature. The chapter begins with the definition of E-readiness and a survey of E-readiness measurement tools. Weaknesses of existing tools are discussed and the proposed tool is presented.

Chapter 7: The chapter presents the quantitative data analysis used to validate the conceptual model developed for the study. Both validity and reliability of the model were statistically tested with data collected for the purpose.

Chapter 8: The validated model was used in this chapter to assess E-readiness in the local government system in Ghana for the diffusion of E-government. Qualitative data was also used to assess the impact of E-government on the decentralization process and factors affecting the diffusion of decentralization in the local government system in Ghana.

Chapter 9: This is the concluding chapter where the findings of the study are presented. The chapter also presents the recommendations made based on the research and the conclusion of the study indicating the implication of this study on E-government implementation, the areas requiring further research and the contribution of this research.

CHAPTER 2

2 LITERATURE REVIEW

2.1 Introduction

This chapter examines the literature on the three core concepts in this thesis namely E-government, decentralisation and the re-engineering of government. The chapter begins with the emergence of E-government and the stages of E-government maturity as well as the importance of E-government. Then a look is taken at the historical antecedents of public sector reforms leading to the emergence of E-government beginning from decentralisation to the new public management paradigms. Re-engineering government processes is then discussed and the chapter concludes with the need for re-engineering the existing local government systems to take advantage of E-government. A value proposition of E-government for local government is then extracted from the literature and presented.

2.2 The Emergence of E-government

E-government is a governance model focusing on the utilization of information and communication technologies (ICT) for the delivery of public services conveniently to citizens and other stakeholders (Heeks, 2006). This potentially transforms governance making it simple, moral, accountable, responsive and transparent. E-governance thus utilizes information and communications technologies for enhanced decision making processes and wider public participation in government (Gupta & Bagga, 2003; Report on Business Process Re-engineering for E-governance Projects, 2010).

E-government has become a global phenomenon. The industrialized countries have used and continue to use it to provide effective, transparent and efficient public services (Bhatnagar, 2003), whilst the developing countries are initiating E-government policies and strategies with the support of bilateral and multi-lateral donor agencies (Ahn & Bretschneider, 2011). E-government promises the strengthening of government performance resulting in efficient and effective government and public administration, a necessary precondition for economic and social development (Bekkers & Homburg, 2005).

The revolutionary advances in information and communication technology (ICT) are impacting on every aspect of human activity (Bekkers & Homburg, 2005) by creating ubiquitous communication infrastructure, enabling ever-present media that facilitate real-time

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social and personal interactions across continents. ICT undoubtedly has proven to be the catalyst to socio-economic transformation unprecedented in human history (Eason, 2005).

Perhaps, taking the cue from the private sector adoption of ICT for organizational transformation; governments continue to diffuse ICT to propel public sector transformation with the objective of infusing efficiency and effectiveness into the management and government services delivery (INSEAD, The Global Information Technology Report 2012).

The term E-government or Electronic government is an outcome of this ICT-enabled government transformation. E-government has thus become the buzz word for public administration as well as in the ICT domain (Eifert & Püschel, 2004). E-government has the potential to simplify and improve internal government operations and government interaction with its stakeholders. Where effectively diffused, in a number of developed countries such as Denmark and the United Kingdom, E-government has provided efficiency and effectiveness in the delivery of government services by bringing national, regional and local administrations to within a click away from the citizens and aiding effective decentralisation and democratisation (Drüke, 2005)

This however, cannot be said of many developing countries such as Ghana with over a decade of implementing their ICT policies. Citizens, businesses and other stakeholders of the government in these countries continue to experience the compartmentalized and departmentalized government services with the attendant inefficiencies and ineffectiveness to say the least (Yarney, 2005)

However, if E-government is to facilitate the meaningful change it promises, governance and the government would have to be reengineered in terms of structure, processes and service delivery approach (Kraemer & King, 2008).

2.3   The Concepts of E-government and E-governance

The vagueness of the concept and definition of E-government is epitomized by the varied definitions provided in different studies. There is often the tendency for E-government definition to be technologically deterministic, overemphasizing the technological artefacts and ignoring the social, managerial, policy, people, cultural and organizational aspects (Heeks & Santos, 2009). Often the temptation is to focus on the concrete, technical perspectives without much attention on the institutional and human aspects. Also prominence is given the trend of technological advancements with the potential to transform governance. E-government is however a socio-technical system highly dependent on institutional

capabilities, regulatory and policy directions, and socio-cultural considerations (Sarantis, Charalabidis, & Askounis, 2011).

E-government studies could be viewed from three perspectives as identified from the existing body of E-government research.

i. *Technologically Deterministic View*: this view approaches E-government research primarily to answer technological questions from a single or multi-organizational stance. Such questions might include which ICT system to introduce, how to design the business processes or what innovative hardware-oriented or network concepts to apply (Bekkers & Homburg, 2005). This approach has been used by various academic disciplines mostly information systems and technology researchers. It rarely used in public administration research (Calista & Melitski, 2007). This view approaches E-government as technology-oriented endeavour with an interdisciplinary perspective. This perspective portrays E-government as a technological innovation with very little consideration given to the study of the organization and the type of political administration as facilitating successful diffusion of E-government (Dawes, 2008).

ii. *Socio-Technical View*: This approach views E-government from a process-oriented perspective and has been widely used in information systems research drawing from theories such as Diffusion of Innovation (Rogers, 1983) and Technology Acceptance Models (Tornatzky & Fleischer, 1990). Ths approach has helped in identifying critical influencing factors for organizational ICT diffusion and highlights the importance of extensive technical knowledge in analysing ICT innovation and diffusion processes (Heeks & Santos, 2009).

iii. *Socio-Political View*: This approach to E-government study draws heavily from political science and public administration research for public sector utilization of information and communication technologies (ICT) (Niehaves, 2007). It views E-government as socio-political administrative system, which is characterised by recent comprehensive reform efforts such as new public management and decentralisation approaches which could be facilitated by technology (Irani, Elliman, & Jackson, 2007).

The influences of these perspectives reflect the varied definitions of E-government by different institutions and researchers tilting towards one or more of the perspectives above. These definitions often reflect the position and background of the researcher and the institution (Kim, 2005).

E-government is therefore defined as the government's use of information and communication technologies, especially online technologies, to ensure fast and agile service delivery by public organizations (Bellman & Rausch, 2004). This definition, however limits E-government to the computerisation of governance processes to drive change in public service delivery (Jones, Hesterly, & Borgatti, 1997). In the developing countries such as Ghana, the structures of government and the service delivery models might limit the ability of ICT utilization to engender the above transformation.

This study thus associates itself with the definition of E-government as the re-engineering of the government and governance to facilitate the effective diffusion and utilization of information and communication technologies in the provision of public services (Eifert & Püschel, 2004). This socio-technical deterministic definition of E-government takes an unbiased view of the relationship between information and communication technology and public organizations (Grönlund, 2002). The definition emphasises on the restructuring of public organizations to facilitate the utilization of information and communications technology to contribute to various structural changes in the public sector service delivery (Henriksen & Mahnke, 2005; Backus, 2001). While this study shares some the views expressed in this definition, it lacked the economic development perspectives of many of the ICT policies formulated in the many developing countries in the last couple of decades to deploy and utilize ICT as driver of socio-economic transformation of their economies

From the viewpoint of development economists therefore, E-government is a recognised strategic means to improve national competitiveness and economic activation (United Nations, 2008). These are done through the development of optimal public service delivery channels that utilize directly and indirectly information and communication technologies (Ndou, 2004) and support the industry which develops and supplies the supporting network infrastructure (Hafkin, 2009).

The emerging developments in the Internet and the World Wide Web as well as modern wireless communication technologies have opened whole new opportunities for new service delivery channels for public administrators thereby contributing to the high interest in E-government (Carrizales & Holzer, 2008). Governments across the globe are harnessing the capabilities of these technologies to facilitate interaction within government departments and agencies (Irani, Al-Sebie, & Elliman, 2006) as well as between government and citizens, businesses, employees and other non-governmental agencies (Kraemer & King, 2008) thereby fundamentally re-engineering the relationships between governments and its stakeholders (Calista & Melitski, 2007).

Fang (2002) and Ndou (2004) provide a broader expatiation of E-government as governments' use of advanced information and communication technologies, particularly web-based Internet applications, to facilitate easy and convenient access to information by citizens and businesses, to improve the quality of government services delivery and provide citizens and other stakeholders, greater opportunities to participate in democratic institutions and governance processes. This includes transactions between government and business, government and citizen, government and employee, and among different units and levels of government.

In practical terms, E-government means providing accessible and useful electronic public services, and thereby, empowering citizens through participation. E-government does not only focus on the electronic delivery of public services, it also encourages citizens' participation in governance through the facilitation of information accessibility and knowledge acquisition by the citizenry (Hanna, 2011). In addition, E-government facilitates easy access to public services and better communication between government and its stakeholders. These initiatives result in increased transparency and ultimately better governance, which has become a critical requirement to attract donor support as well as foreign investments in this competitive global environment (Budhiraja & Sachdeva, 2008).

While the concepts of E-government and E-governance are often used interchangeably, a survey of the literature presents a different view of each. E-governance is perceived as processes and interactions while E-government is more institutional. E-governance involves technologically mediated channels for accessing government, leading to new approaches to leadership, transaction of government business and the organization and delivery of government information and services (Schuppan, 2009).

E-governance is therefore, a powerful tool in the hands of governments for their transformation given the possibilities that information and communication technologies can offer (Calista & Melitski, 2007), however, like any other tool; ICT is limited in its value and relevance unless it is applied to specific objectives and goals (Gilbert & Cordey-Hayes, 1996). E-governance thus elicits the commitment for the utilization of appropriate technologies to improve internal and external governmental relationships for the advancement of democracy, promote economic growth and ensure fair, effective and efficient service delivery to all as well as create a faster and quality decision making environment (Finger & Pécoud, 2003).

2.4 Classification of E-government

The classification of E-government can be viewed from the perspective of ICT facilitated relationships between government and its key stakeholders, namely with citizens (G2C – Government-to-Citizen), with businesses (G2B – Government –to-Business); with other governments, government departments and agencies (G2G – Government-to-Government); and with its employees (G2E – Government-to-Employees) (Caldow, 2004; Christensen & Lægreid, 2007).

2.4.1 Government-to-Citizen E-government (G2C)

This classification describes a citizen-centric approach to E-government. This model makes government information ubiquitously available online freely or on demand, providing online services to meet citizens needs while enabling them to be heard and participate in the affairs of government (McNabb, 2009). This is done through web technologies such as government portals with hyperlinks to government services around the pre-existing structures of the administration and its bureaucratic procedures (Ebrahim & Irani, 2005).

Governments are adopting and adapting the e-commerce strategy of consumer-centricity to ensure citizen satisfaction with their online experiences in interactions and transactions with government. Emerging Government-to-Citizen relationship provides citizens the opportunity to interact with their governments as political actors and participants in democratic processes, often referred to as E-democracy (Edmiston, 2003).

While attempts are being made by developing countries to emulate the examples of the developed countries in terms of electronic interaction with citizens, not many empirical studies have been done to unearth the state of the development of this type of e-government.

2.4.2 Government-to-Business E-government (G2B)

The facilitation of the government and private sector business interactions such as procurement and tax assessments in a technologically mediated environment, are referred to as Government-to-Business E-government (G2B) (Finger & Pécoud, 2003). In most economies especially developing economies, government procurement is quite substantial and is often fraught with all sorts of inefficiencies leading to huge loses. G2BE-government therefore creates faster, more cost-effective and transparent routines in handling the routine procedures for procurement (Moon 2002).

Governments put e-procurement systems in place to improve document management, reduce costs, reduce processing times, improve access to markets for goods and services, and increase transparency of public decision-making (Bhatnagar, 2003; NOKIA, 2008).

Acquisition of business operating licenses and award of contracts are made more efficient and transparent, enabling fair competition for local business and improving the country's business environment (ITU, 2008).

2.4.3 Government-to-Employee E-government (G2E)

Governments employ a large number of people. This model of E-government describes the technology-mediated interactions between government and its employees. This ensures effective coordination of government operations thus improving efficiency and effectiveness of government business processes. This includes internal communications and inter and intra agency coordination (Al-Wadhi & Morris, 2009; Drüke, 2005).

2.4.4 Government-to-Government Model (G2G)

Government-to-Government model refers to the interaction and provision of services among government agencies and departments facilitated by information and communication technologies. This technology-enabled inter and intra-department relationships ensure the avoidance of duplication of efforts and resources (Christensen & Lægreid, 2007). Interoperability frameworks developed with the implementation of E-government ensure that government departments could share resources otherwise not possible in the manual environments, thus creating a faster and quality decision-making environment. G2G incorporates activities of stakeholders and coordinating authorities from the national, state or provincial, and local government (ITU, 2008).

While these classifications make for good understanding of the relationship that could develop between government and its stakeholders through e-government, it must be noted that the applicability of these classifications would largely depend on the level of maturity of e-government in the particular country. In the developing countries where e-government development is at the nascent stages, these classifications might not be very visible especially with few empirical studies done on the applicability of these classifications in the context of developing countries with different political cultures.

2.5 E-government Models and Services

At maturity, E-government incorporates four key governmental dimensions and services namely:

i. E-services, which enable government information and public services to be delivered in varieties of electronic channels such as the Internet and mobile media. E-services facilitate ubiquity in the access and delivery of government service (Dawes, 2008).

ii.	E-democracy drives increased participation in the public decision-making process such as civic engagement on proposed bills through an electronic media and the development of electronic voting as emerging in some developed countries (Caldow, 2004; Eifert & Püschel, 2004; Dawes, 2008). The increasing use of the social media by governments is to engage citizens and drive citizens' participation in the governance process (Clift, 2002; Howard, 2012).

iii.	E-commerce involves the settlement of financial commitment between government, private sector and citizens electronically (Andersen & Henriksen, 2006). This could be government paying for goods and services or its employees or the private sector honouring its financial obligations to government such as taxes, utility bills, renewing vehicle registrations (AlAwadhi & Morris, 2009).

iv.	E-management refers to the use of information and communication technologies to improve the management of government agencies and departments. This facilitates easy and effective interactions among government institutions, streamlining processes and improving the flow and integration of information thus making government agile and responsive to citizens (Medjahed & Bouguettaya, 2005).

## 2.6	Stages in E-government development

The widespread interest in E-government by researchers, public policy experts as well as information and communication technology professionals has contributed to the documentation of best practices which are applied in monitoring the progress of E-government diffusion and adoption in different countries (Gil-Garcıa & Pardo, 2005).

E-government diffusion and adoption go through various stages, from inception to maturity the characteristics of which are aptly described in E-government maturity models (Irani, Al-Sebie, & Elliman, 2006). These stages differ in nomenclature and characteristics with overlapping descriptions. The E-government maturity models have been developed or proposed by researchers, development practitioners and international organizations. They generally range from four-staged to six-staged maturity levels and portray E-government as an evolutionary process (Irani, Al-Sebie, &Elliman, 2006).

This study identifies six evolutionary stages of E-government diffusion and adoption which may not be described as sequential but provide descriptive characteristics of the growing maturity of E-governance.

The nascent stage of E-government involves information publishing and dissemination. At this stage, websites for government, its departments and agencies are developed to provide

quality information that could be accessed by citizens (Moon, 2002; Layne & Lee, 2001). This stage is also described as information distribution, cataloguing or web presence (UN-DESA, 2008; Howard, 2001). For most developing countries, this stage is also referred to as the infrastructure stage. The second stage involves the deployment of information communication infrastructure both within the public sector and communities, access to which should be relatively affordable and trustworthy to stakeholders (Bekkers & Homburg, 2005; UN-DESA, 2008).

E-government is considered to have matured to the interactive stage, the third stage where there is official provision of a two-way transaction and some level of online interaction between government and its stakeholders (Andersen & Henriksen, 2006). It is an enhanced stage with the provision of online services such as tax assessments and exchange of electronic communication between government officials and its stakeholders (Netchaeva, 2002; Zarei, Ghapanchi, & Sattary, 2008). At this stage information and communications technologies infrastructure deployed is utilised to better disseminate government information and delivery services through effective models utilising varieties of electronic delivery channels (UN-DESA, UN E-government survey 2008; Alemna & Sam, 2006).

The fourth maturity stage describes the stage where multi-purpose portals are developed by governments and utilized by citizens and businesses (Irani, Elliman, & Jackson, 2007; Layne & Lee, 2001). These portals provide one stop shop for government services with relevant information, enabling transactions with relevant departments and agencies through hyperlinks (Peristeras & Tarabanis, 2004; Szeremeta, 2002). Among the services provided at this level are financial transactions and registration businesses (Andersen & Henriksen, 2006; Rizvi, 2008). This stage is characterised by transformation of government institutions positioned for the adoption of innovative services delivery models (Andersen & Henriksen, 2006; Janssen & Veenstra, 2005).

The fifth stage of maturity is characterised by the existence of portal personalization where citizen and business experience services tailored for them through the use of a registration code or a password which load the relevant information about or services required by each citizen (Szeremeta, 2002; Shih et al, 2008). This stage is also referred to as vertical and horizontal integration (Layne & Lee, 2001).

The sixth stage is classified as clustering of shared services (Netchaeva, 2002) while the sixth stage is where E-government is deemed to have reached maturity. This stage is described as comprehensive integration and enterprise transformation (Layne & Lee, 2001; Howard,

2001).These last two maturity stages provide the environment for democratic participation by stakeholders at all levels of government (United Nations, 2008; Janssen & Veenstra, 2005).

A number of the maturity models are criticized for emphasising on web technologies and its sophistication while presupposing existence of network infrastructure, technology and experienced users for E-government services (Ndou, 2004). Most of the models, therefore, are more suitable for the developed countries where E-government was built on the back of existing telecommunication infrastructure and substantially literate population (Kitaw, 2006)

In the developing countries such as Ghana, E-government has been the driver for growth of information and communication infrastructure to a large extent (Dzidonu, 2003). These models could either over-estimate or underestimate the maturity of E-government in these countries (Choudrie, Umeoji, & Forson, 2012).

The maturity models are often diagrammatically charted as lying on a straight line between two coordinates with linear and sequential maturity processes with the vision of progression from passive manual inefficient government riddled with inefficiencies to informational E-government, interactive, transformative E-governance (Marche & McNiven, 2003). The sequential thinking E-government maturity however, muddles the E-governance in the public sector, as it assumes that E-government and E-governance occur linearly and interchangeably. E-government maturity models have also been thought of as technologically driven (Andersen & Henriksen, 2006; Dawes , 2002).

Andersen & Henriksen (2006) argue that if these maturity models are to be relevant measures of the progress of E-government, they must capture the progress of E-government as public sector modernization and not necessarily technological progressing of government service delivery. This would ensure a fair assessment of E-government maturity in developing countries where connectivity infrastructure in the public sector began mainly with the implementation of E-government (Dzidonu, 2003).

E-government is not just the infusion of technology into existing government structures, but a process of re-engineering the whole governance and government structures for effective and efficient governance through the utilization of information and communication technologies.

2.7 Enabling E-government Reforms

E-government diffusion is significantly affected by the processes, preparedness, the technology and the people within government institutions as well as other stakeholders (Ahn & Bretschneider, 2011). Successful diffusion of E-government is thus premised on re-

engineered governance procedures and processes as well as the structure of government but not just on the introduction of information and communications technologies (Caiden, 2008). The diffusion of an innovation such as E-government into the Weberian system of government with its rigorous procedures and departmentalization especially in developing countries could be a herculean task (Grover et al, 1995). Successful diffusion of E-government, therefore, would require re-engineering similar to business process re-engineering that facilitated the introduction of information and communication technology in the private sector (Gupta & Bagga, 2003).

Business process reengineering (BPR) is a powerful tool for government institutions to evaluate and redesign their business processes through the implementation of computerized information system (Grover et al, 1995). The success of BPR in the private sector influenced governments in the developed world to rethink how to satisfy citizens who are experiencing the efficiency and quality of service from the private sector and are therefore expecting the same or similar services from their governments (Christensen & Lægreid, 2007).

2.8   Business Process Re-engineering (BPR) – Definition

In many a developing country such as Ghana, there is always the temptation to view E-government from a technologically deterministic perspective with all the attention on the deployment of technological infrastructure. A critical look at the e-Ghana project gives a hint of this (Bediako, 2012)   However, E-government facilitates great waves of technological innovations in public sector administration and thus requires fundamental reforms which could be modelled on business process reengineering (BPR) as pertained in the private sector (Bekkers & Homburg, 2005). Business process reengineering gained wide acceptance with the introduction of e-business (Grover et al, 1995).

Business process re-engineering is defined as the process of fundamentally redesigning an organization's process of performing its functions and delivery of services with the aim of bringing about significant improvements in its operations (Kulkarni et al,2013). It could result in downsizing, restructuring, reorganization, automation or introduction of new technology as a result of examining and changing the organization's strategy, processes, technology, structure and culture (Davenport & Stoddard, 1994). Any attempt therefore, to diffuse E-government in especially developing countries without the accompanying reform of the public sector could reduce or scupper the potential benefits of E-governance

2.9   Strategic Objectives for Government Processes Re-engineering

With growing digital generation and the experience from the private sector service delivery, government systems reengineering is being driven by strategies that would make governments agile, effective, responsive and transparent (Eason, 2005). For developing countries where government service delivery is fraught with corruption, nepotism and excessive bureaucracy (Boachie-Danquah, 2011), government process re-engineering could result in;

i.   The development of technology-enabled government processes where the deployment and the utilization of information and communication technologies would be made central to the redesigning of government processes and service delivery across all departments (Gupta & Bagga, 2003).

ii.   The effective management of government information. Government data and information scattered across ministries and departments need effective management throughout their life cycle. The capturing, processing and storing of government information could be re-engineered to facilitate easy exchange and reuse whilst ensuring security and easy retrieval for decision making (Bekkers & Homburg, 2005).

iii.   The facilitation of service-oriented governance in which the re-orientation of government processes to focus on satisfying citizens' needs in terms of fairness, convenience and quality service delivery (Holliday, 2002). This would also promote partnerships among all stakeholders including private sector agencies (Hunter, 2010).

iv.   The streamlining of government service delivery process to eliminate waste in terms of time and resource by repeating and filling the same forms seeking the same data from department to department. This would reduce service turnaround time between government and citizens, businesses and employees (Homburg & Snellen, 2007).

v.   The standardization of government service delivery process which is known to citizens and businesses to ensure same type of jobs and service are delivered in like manner (Rizvi, 2008). This would reduce the frustrations citizens go through in accessing government services which changes depending on who you meet at the service point (Budhiraja & Sachdeva, 2008).

vi.   Continuous improvement of services in which the redesigned government processes would include acceptable performance indicators and procedures for feedback from users (Krishna & Walsham, 2005). This would enable continuous improvement in government service delivery by adapting to changing user demand and the technological environment (Lucke, 2010).

vii. Sustained monitoring and evaluation of E-government projects and programs by the implementing departments and institutions to ensure that the systems put in place are functioning as per design. Evaluation could be undertaken by independent agencies using prior agreed set of performance indicators (O'Neill & Sohal, 1999).

These objectives or their variants must be present in any E-government strategy document and enforced to ensure its successful diffusion.

2.9.1 Approaches to Government re-engineering

Government re-engineering could lead to fundamental transformation of the current processes used by the government departments (Homburg & Snellen, 2007). Depending on the resources, the existing systems and processes, government reengineering could be approached from one or more of the following perspectives;

i. Redesigning and realigning existing processes to respond to current demand and technological advances for the purposes of performance enhancement and improvement in service delivery (Krishna & Walsham, 2005).

ii. Fundamental rethinking and redesigning the existing processes to significantly and radically alter the process of execution of a task. However, the processes and tasks remain largely the same (Kraemer & King, 2008).

iii. Complete replacement of government service delivery process with the aim of avoiding the existing problems. This requires that tasks are changed rather than replicated in other forms (O'Neill & Sohal, 1999).

iv. Removing an unnecessary process or replacing a process which has a significant negative impact on the overall performance of a system or the establishment (Report on Business Process Re-engineering for E-governance Projects, 2010).

v. Identifying a non-core activity for outsourcing to enable the organization to concentrate on its core function or service delivery (Grover et al, 1995).

2.9.2 Factors Influencing Government Processes Reengineering

The realization that technological changes should be accompanied by changes in organizational structure, policies, and human resource management approaches has been part of the socio-technical approach to organizational change such as E-government diffusion (Eason, 2005). Such reengineering leads to organizational transformation by introducing efficiencies and often irreversible changes to its operations (Davenport & Stoddard, 1994). Organizations have used reengineering to reinvent themselves by modelling and developing

new business processes and restructure the way work is performed using computerised information systems (Christensen & Lægreid, 2007).

The private sector business process reengineering offered useful patterns to assist government institutions and departments in redesigning their core processes to meet the demand of the growing digital generation (Gilbert & Cordey-Hayes, 1996), and emerging countries could take a cue from that. The re-engineering of government requires preparation and commitments of top political leadership, assessing and developing competencies to reduce the risk of change resistance (Davenport & Stoddard, 1994) especially in developing countries where the use of technology is viewed with suspicion by those in authority (Arpaci, 2010).

The socio-technical nature of ICT-enabled government process re-engineering provides the possibility of drawing from the experiences of the private sector in identifying the potential risk factors that might hinder the E-government diffusion (Damanpour et al, 1989). Information systems implementation research emphasises factors like top management support, systems quality, and user initiation as motivating business process changes in organizations (Bozak, 2003; Zand & Sorensen, 1975).

Kling, (1996) and Bozak (2003) thus describe Lewin's three sequential phases of institutional change process that are very relevant to E-government diffusion in developing countries like Ghana where the reforms in the public sector have not kept pace with technological developments:

i.   The unfreezing stage is the initiation point. This is the stage where diagnosis and facilitation of a climate for change through the disconfirmation of existing, stable behaviour patterns take off (Bozak, 2003). The unfreezing process begins with the study of the institution's current situation to identify the problems and the opportunities for improvement (Burnes, 2004).

ii.   The moving stage involves analysis, design, and installation of an innovation that replaces or improves existing reliable systems (Kling,1996). It is the point of adoption where a decision is reached to commit the necessary resources to support the implementation effort (Burnes, 2004).

iii. Refreezing stage is the institutionalization of the change (Kling, 1980). It is the implementation phase where solutions identified in phase one and adopted in the second stage are developed, installed, adapted where necessary and diffused throughout the organization (Burnes, 2004).

E-government has thus succeeded in countries where the highest political authorities have shown strong commitment for change with E-government projects that have well-defined and specified plans for implementation (Weick & Quinn, 1999) and have stayed involved until widespread application of the E-government innovation has been routinized (Teng , Grover, & Fiedler, 1994). These, therefore, make E-government an institutional effort towards the diffusion of ICT innovation into governance.

2.9.3 Threats to Government Reengineering Process

E-government like any reengineering could face opposition if the processes of initiation, adoption and implementation are not properly handled (Zand & Sorensen, 1975). Such resistance have been explained from three theoretical perspectives and differ in their assignment of the causal agent for the results observed (Kling, 1996).

   i. People-oriented resistance theory posits that resistance to new systems introduced in organization is a creation of factors relating to users as individuals or groups such as age and gender as well as background, value and belief systems (Jianga et al,2000).

   ii. The system-oriented resistance however postulates that factors inherent in the system's design or the type of technology being deployed could be the source of resistance. Such factors include user interface, performance, reliability and the level of centralization, distribution, or decentralization (Klaus & Blanton, 2010).

   iii. Interaction theory attributes causality to the interaction between people and system factors. Central to this perspective is the belief that systems acquire different political and social implications in different settings, and users' perceptions of the effects of the same system may differ (Jianga, Muhannab, & Klein, 2000). A well- intentioned and designed system might be resisted by powers that be for the risk of losing their grips on power or social status in the organization. The interaction theory argues that opposition to ICT-driven institutional re-engineering is not necessarily influenced by the system itself or the characteristics of users but the perceived values and social content gain or loss before and after system implementation (Bozak, 2003) .

The potential benefits of E-government such as increased efficiency and transparency in operations and service delivery of governments could be realised in the developing countries only when government and governance processes are re-configured to provide enabling platform for E-governance to thrive (Mitchell et al, 2003; Eifert & Püschel, 2004).

However, such re-configuration especially in developing countries often faces serious threats from unbridled political executive and management control, election cycles and

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administration changes which often result in cessation of on-going reforms (Batley & Larbi, 2004). Legislative frameworks, taxpayer accountability, competition for limited available funding and resources and the relationship with international, state, and local governments could also provide potential threats to governance reengineering (O'Neill & Sohal, 1999).

The diffusion of E–government could induce different outcomes in different settings and perceptions by the same group of users (Jianga et al, 2000; Heeks & Santos, 2009; Iivari & Hirschheim, 1996). Government and governance re-engineering would therefore face a political variant of the interaction theory where participating government institutions do not agree on the types of problems to be solved, uncertain about whether the system could solve the current problems and where the power bases involved are highly valued (Kettinger et al, 1997).

The challenges facing developing countries in harnessing the full potential of E-government therefore remain daunting. This is because, beyond the installation of functional information systems, understanding the environment in which the systems is being deployed, managed and applied is essential (Heeks 2006). Although technical issues would continue to attract attention in E-government, the need for requisite change management strategies to ensure that the government institutions and their stakeholders could cope with the resultant change to ensure a smooth and painless transition is very critical (Fuchs, 2008).

The increasing demand for and utilization of information and communication technology in public services delivery are altering the nature of government with the relationships, authority and responsibility between government and citizen and among private and public sectors being redefined (Janssen & Rotthier, 2002). The re-engineering of government processes is therefore a sine qua non for developing countries to enjoy the benefits that E-governance offers (Rizvi, 2008).

2.10 Public Sector Reforms

The modern public sector seeks to reverse the traditional role of government and public institutions which emphasized institution building, bureaucratization and nationalization to one that facilitates private and corporate-driven marketplace. Reforms such as privatization, commercialization, marketization, and contracting out, together with a number of institutional changes promote this ideological shift on a global scale (Batley & Larbi, 2004).

Public sector reform is thus a multidimensional endeavor involving a range of phenomena with different countries embarking on one or a combination of reforms at any time. Among the major public sector reforms over the last couple of decades in both developed and

developing countries are decentralization, privatization, incorporation, deregulation and reregulation (Shah, 2006).

In the last couple of decades however, technology-enabled public service delivery has been at the forefront of public sector reforms (Homburg & Snellen, 2007). The pressure of globalization, development partners and inter-governmental organizations have compelled both developed and developing countries to extensively reform and streamline their public administration to make their countries competitive and for the benefit of their citizens (Lane, 2000; Farazmand, 2002).

The profound role information and communication technologies (ICT) play in the private sector service delivery has not been lost to the public sector and the need to reengineer traditional government organization and administration to benefit from such technologies has become a priority in the last couple of decades (Ahn & Bretschneider, 2011).This E-government endeavor has essentially improved administrative machineries, reduced duplication and waste, and increased productivity in the public sector management in many developed countries (Ahn & Bretschneider, 2011). Predictably, developing countries have been compelled to diffuse technology in their public administration with varying degrees of success.

2.11 Decentralisation

One of the key public sector reform initiatives in the 20[th]century, especially in post independent Africa is decentralization (Ahwoi, 2011). Decentralization is defined as the transfer of responsibility and authority from central government to subordinate territory, quasi-public organization or private sectors in the performance of public functions (Shah, 2006). It also involves the restructuring and the reorganization of authority to create a system of co-responsibility between the central, regional and local level governance on subsidiary principles (web.undp.org, 1999).

Decentralization transforms the roles and relationships of societal actors to ensure quality and effective governance with enhanced responsiveness, transparency and accountability. It leads to the development of sub-national institutions' capacities to encourage participation in economic, social and political decisions as they affect a particular locality (Cheema & Rondinelli, 1983). If effectively implemented, decentralization could facilitate the eradication of decision making bottlenecks resulting from central government ministries and make government responsive to local needs often resulting in creative innovative solutions through local experimentation (Crook, 2003; Grindle, 2007).

2.12 Types of Decentralization

Decentralization varies in types and practices with diverse impacts on the anticipated good governance, the unit sharing authority and the unit to which an authority is being transferred. Decentralization can be political, administrative, fiscal, and market with overlapping characteristics (Conyers, 1984).

2.12.1 Political Decentralization

The concept of political decentralization concept assumes the election of representatives from local electoral jurisdictions with better knowledge of the needs and desires of their constituents (Crook, 2003). Constitutional reforms, pluralistic politics, strong legislatures, demarcation of local political units, and effective public interest groups are prerequisites for effective political decentralization (Cohen & Peterson, 1996).

2.12.2 Administrative Decentralization

Administrative decentralization involves the redistribution of power, responsibility and other resources by the central government and its agencies to local authorities and local sub-units of government departments and agencies or regional and functional authorities for governance and the provision of other public services (Cheema & Rondinelli, 1983). Administrative decentralization can take three forms, namely de-concentration, devolution and delegation.

i. De-concentration is considered the weakest form of decentralization. It is mostly used in unitary countries to redistribute the central government's decision making powers and governance responsibilities to lower levels of government, its agencies and departments (www1.worldbank.org). It just shifts responsibilities from central government in the capital to the regions, provinces or districts with the creation of local administrative capabilities with strong monitoring and control from the central government (Cheema & Rondinelli, 1983).

ii. Delegation is considered a more extensive form of decentralization. It involves the transfer of decision-making and administrative function from central governments to semi-autonomous institutions such as housing authorities and independent school districts (Grindle, 2007). Such institutions are normally less constrained by the regular civil service and have greater discretion in decision-making but remain accountable to the central government (Pollitt, 2007).

iii. Devolution is considered the most extreme form of decentralisation. Government authority for decision making, financial and general management is transferred to

semi-autonomous units of local government. This includes the transfer of responsibilities for public services delivery to municipalities with elected mayors and councils who raise their own revenues and have authority to make decisions on investment in local infrastructure (Drüke, 2005; web.undp.org, 1999).

2.12.3 Fiscal Decentralization

Fiscal decentralization is an essential part of the decentralization process, because carrying out decentralized functions effectively requires adequate revenues either from local sources or transferred from the consolidated funds or both (web.undp.org, 1999). Fiscal decentralization could take the forms of self-financing and cost recovery through user charges, co-financing and co-production arrangements and local taxation (Conyers, 1984). There is usually a revenue transfer deal with the central government for specific and general uses. Fiscal decentralization empowers local resource mobilization, borrowing among other means of financing local public service provisioning (www1.worldbank.org).

2.12.4 Market or Economic Decentralization

Market or economic decentralization leads to privatisation and deregulation (web.undp.org, 1999). It enables the transfer of governmental functions, which hitherto were the exclusive responsibility of the central government, to be carried out by private sector entities, civil and voluntary associations as well as non-governmental organizations who introduce a commercial approach to the provisioning of such services (www1.worldbank.org).

2.13 Limitations of Decentralization

The benefits of decentralization might not always be realized as a result of the loss of economies of scale and mismanagement of scarce financial resources by the local government officials (Antwi-Boasiako, 2010). In situations where there are weak administrative or technical capacities at the local levels, service delivery may be inefficient and ineffective (Cheema & Rondinelli, 1983). Local governments with insufficient financial means and resources would have difficulties in delivering essential services to the people (Boachie-Danquah, 2011). Coordination of national policies in highly decentralised administration can be complex with the likelihood of local elites hijacking local services delivery (Crook, 2003).

With most of these problems being practically human, would E-government be the tool that would propel the achievement of good governance that public administrators and all stakeholders have long been searching for? For E-government to answer the question above

there is the need for the existing local government structure, administrative processes and service delivery model to be re-engineered to adapt to E-governance (Burnes, 2004; Davenport & Stoddard, 1994).

2.14 E-government in Decentralization

Local Government represents the highest form of decentralization with municipalities being the closest level of government to the citizens. This makes local governments effective in responding to local issues and interest (Edmiston , 2003). Local governments in developing countries are therefore making efforts to launch local E-government programs (Ifinedo, 2006) (e.g. www.ama.gov.gh), starting with computerisation of basic secretarial duties to development of static informational websites (Drüke, 2005).

The essence of decentralization is to encourage local response to local demand for expanded and quality public service delivery. These demands could be met through approved fiscal decentralisation, reduction in bureaucracy, responsive and ubiquitous government. This makes it imperative for decentralized institutions and departments to diffuse E-government (Carrizales & Holzer, 2008).

In spite of the increasing government investments in E-government diffusion, local government authorities seem to be lagging far behind with few taking proactive initiatives to strategically diffuse E-government in developing countries (Edmiston, 2003;Welch & Grimmelikhuijsen, 2012). This problem is worse in developing countries (Choudrie, Umeoji, & Forson, 2012; Mzyece, 2012).What is considered web presence by few local authorities is static websites often with incomplete and out-dated information mostly suffering from lack of updates (Shah, 2006; Welch, 2012). This continues to be the case despite the wide recognition of the potential of E-government to facilitate the achievement of the core objectives of decentralization such as local participation of governance and decision making and bringing public services to the doorsteps of the local population among others (Cheema & Rondinelli, 1983; Drüke, 2005).

Ultimately E-government would lead to the digitizing of government information, performance of electronic transaction by citizens and businesses, computerisation and streamlining service production and delivery process, enhancing the efficiency of staff, providing the public access to government information and facilitating e-participation (Al-Wadhi & Morris, 2009).

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2.14.1 Factors Affecting E-government Diffusion in Local Governments

Development and deployment of E-government services in local government requires resources to build up managerial and technological capabilities (Ebrahim & Irani, 2005). This has been difficult for even central government due to the complexity of the technology, deeply entrenched organizational routines, and the socio-cultural environment into which E-government innovation is being diffused (Irani, Al-Sebie, & Elliman, 2006). E-government diffusion could result in reengineering of organizational and institutional processes. This requires the existence of skilled and technologically adaptable employees and citizens who are willing and cooperative to adopt E-government, a necessary condition for successful diffusion of E-government in the local government system (Abdallah & Fan, 2012; Heeks & Santos, 2009).

The local and regional authorities lack the human capital and the expertise for planning, development and deployment of E-government in the local authorities since they lack the ability to compete with the private sector for such expertise. There is also low technological appreciation among local administrators (Irani, Al-Sebie, & Elliman, 2006) and a large number of the citizens they serve (Rose & Grant, 2010).

The Diffusion of E-government by the central governments in developing countries has proved and continues to prove daunting making it more complicated for local authorities (Gouscos et al, 2007). The slow pace of reforms in public administration, the type of services the local authorities are supposed to provide and the structure of power and authority distribution between the central, regional and local authorities affect the ability of local authorities to initiate such long term interventions as E-government (Al-Wadhi & Morris, 2009).

E-government involves taking computer-based technologies and combining them with human-based administrative processes to develop new ways of serving citizens (Moon, 2002). Local government institutions, therefore, have to adjust their business processes to adapt to ICTs. Since ICTs provide additional capabilities to do things that were not hitherto possible, it often requires change management which is often not available at the local level (Ahn & Bretschneider, 2011).

E-government development and implementation require substantial investments in the developing countries given the lack of connectivity infrastructure in most of these countries (Shah, 2006). The dependence of donor support for E-government innovation often results in

unsustainable funding with the cessation of such donor support. This often impedes progress in E-government diffusion (Dawes, 2008).

Most local authorities in developing countries also do not have existing back-office systems and procedures coupled with resistance to change by employees in such decentralised departments, thereby stifling innovation (Bekkers & Homburg, 2005). If E-government is to be successfully deployed in local governance, local officials in various departments and agencies need to understand and identify the business, legislative and political processes involved in delivery of public services that meets local needs and the local circumstances. This would help develop local practices in which ICTs could be deployed and utilized in the provisioning of such services (Ahn & Bretschneider, 2011).

The enthusiasm with which new technologies are adopted often results in a technologically deterministic approach to E-government diffusion with the thinking that it would solve all the inefficiencies in local governance (Bekkers & Homburg, 2005). Where E-government is implemented without accompanying organizational adjustment and alignment, the expected goals of administrative efficiency and effectiveness is not likely to be achieved (Shackleton, Fisher, & Dawson, 2004).

The issues of security and privacy especially data protection needs to be addressed to inspire confidence among potential users of E-government services. E-government as a socio-technical innovation involves people, processes and technologies, thus the socio-cultural dynamics of the local citizens would affect its successful diffusion (ITU, 2008). Diffusion of E-government in the local governance therefore, calls for the assessment of the technological, political and socio-cultural contexts as they impact on successful diffusion and the capacity of local stakeholders to adopt E-government services (Valdés et al, 2011). This is known as E-readiness assessment and various metrics using various indicators have been developed for its assessment (Budhiraja & Sachdeva, 2008).

2.15 A reflection on the Literature Reviewed

Most of the existing literature on E-government and public sector reforms concentrates on the developed countries. In the developing countries however the researches on these two corroborating strategies for good governance seem to run parallel. Many of the researches in E-government in developing countries have made little use of the social science theories such as stakeholder and institutional theories to provide in-depth understanding of the implementation of such socio-technical systems. The literature on public sector reforms in developing countries on the other hand makes very little mention of technology adoption

theories such as diffusion of innovations theories and socio technical theories such as the TOE framework for technology diffusion. Thus this study would combine theories from both perspectives to develop an understanding of the state of E-government diffusion in a developing country such as Ghana.

3   THEORETICAL FRAMEWORK

3.1   Introduction

The chapter introduces the theoretical basis of the study highlighting the importance of the theories to the study. E-government being a socio-technological innovation called for a multi-theory approach to this research. The chapter discusses the Diffusion of Innovation (DOI) theory to identify types of innovation, innovation decision processes and factors influencing innovation decision. The Technological, Organizational and Environmental (TOE) framework for technological innovation is also discussed to determine the potential technological, organizational and environmental factors affecting E-government innovation diffusion. The Stakeholder theory is also presented to determine the types of stakeholders and their influence on E-government innovation. Finally, Institutional theory was used to determine organizational behaviour in innovation diffusion. These theories provided the basis for the constructs and the predictor variables of the model developed and the questionnaires used for the study.

3.2   Relevance of Theories in the Research

There are tremendous advances in information and communications technology (ICT) and its application in all aspects of human activity (Nam, 2011) generated multi-disciplinary research interest in unearthing the facilitating conditions for its diffusion and the resultant innovations in public administration. Theories are formulated for explaining, predicting as well as understanding a phenomenon. They are also useful for critiquing and extending existing knowledge (Cua & Garrett, 2009). The theoretical framework is accordingly the pivot around which this research revolves. This theoretical framework introduces and describes the theories in this study and explains the existence of the research questions under consideration (Galliers & Land, 1987).

The limited research knowledge of the role of government institutions in ICT Innovation diffusion has resulted in a fragmented policy direction towards the diffusion of ICT innovation in government and governance (Montealegre, 1999). Increasingly, research on user acceptance and use of new technologies appears to be dominating modern information systems research (Zhu, Kraemer, & Xu, 2006; Hu et al, 1999).

Several theoretical models have been used to explain technology adoption and diffusion. Among these are Technology Acceptance Model (TAM), Motivational Model (MM), a combination of Technology Acceptance Model and Theory of Planned Behaviour (C-TAM-TPB), Diffusion of Innovation Theory (DOI) Social Cognitive Theory (SCT) and Model of PC Utilization (MPCU) (Oshlyansky,Cairns, & Thimbleby, 2007). These models are mostly used studying individuals' technology adoption behaviours.

Among institutional diffusion theories are Technology, Organization and Environment (TOE) (Tornatzky & Fleischer, 1990), Diffusion of Innovation Theory (Rogers, 2003), and a combination of individual and organizational adoption such as the Unified Theory of Acceptance and Use of Technology (UTAUT) models (Venkatesh et al, 2003).

These theories can be classified as socio-technical (Fulk, Schmitz, & Ryu, 1995) or psycho-technical in their approaches to explaining organizational and individual adoption of technology (Davis, 1989; Jackson, Poole, & Kuhn, 2001; Venkatesh & Davis, 1996) while a few others adopt information system approach (Knol & Stroeken, 2001; Moore & Benbasat, 2001).

While effort has been made to unify these theories and models (Venkatesh et al, 2003) for easy application, researchers are faced with choosing from among those that best suit their study or, alternatively, provide an adaptation of existing theory such as in Kishore & Cody-Allen, (2006) and Wang& Yang (2005).

The theoretical framework for this research utilizes the Diffusion of Innovations Theory (DOI), Institutional Theory, Stakeholder theory and Technology Organization and Environment (TOE) framework for technological innovation diffusion. The multi-disciplinary nature of E-government research necessitated a multi-theory approach to ensure successful execution of the study. These theories were used due to their explanatory value and applicability to the phenomenon under study.

3.3 The Diffusion of Innovation (DOI) Theory

The diffusion of information and communication technologies with the objectives of improving efficiency and effectiveness in both public and private organizations has witnessed an unprecedented growth. The achievement of desired results from the technology diffusion requires that the technology must be accepted by the organization and used by its members.

The Diffusion of Innovation (DOI) theory is one of the earliest Socio-Technical theories for innovation diffusion (Rogers, 1963) and subsequently updated to take into account the current technological trends (Rogers , 1983; Rogers 1995; Rogers, 2003). This theory has

formed the bases for the development of numerous technology diffusion models such as the technology-organization-Environment (TOE) (Tornatzky & Fleischer, 1990) and the Perception-Based TOE (Kuan & Chau, 2001).

Innovation is defined as a new idea that upgrades an existing condition to meet the changing needs of its potential adopters. Innovations may be products, techniques or processes (Rogers,1963). Hence innovation is the process whereby inventions move into usable form. Diffusion is the extension of the capacity to produce and or use an innovation in practice (Berkun, 2010; Hall & Martin, 2005). The Innovation process thus consists of decisions and activities arising from need recognition, through research, development, commercialization, to diffusion and adoption of innovation by users, and its consequences (Rogers, 1986).
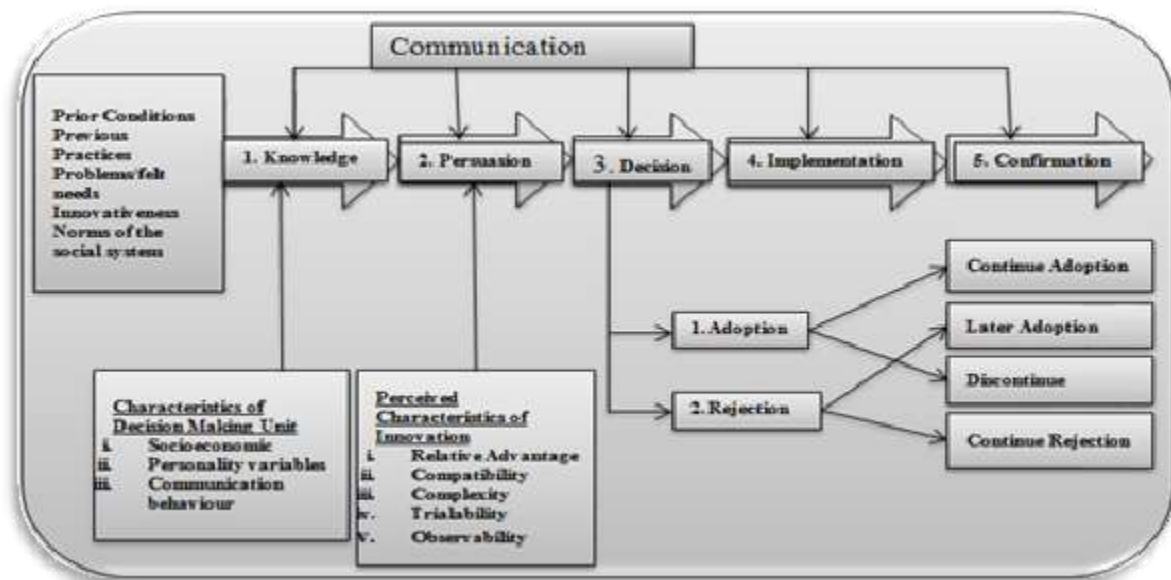
Figure 3-1: Innovation Diffusion Decision Process (Rogers , 1983).

The innovation diffusion decision process consists of the phases of making the decision from initial awareness of an innovation to confirmation of this decision (Rogers, 2003). Morone & Taylor (2001) categorised the innovation process into initiation and implementation phases. The initiation phase involves agenda-setting and matching leading up to the decision to adopt an innovation. The activities at this phase include gathering information, conceptualizing and planning for the adoption of an innovation. The implementation is made up of three stages, namely redefinition or re-structuring, clarification and routinization (Plessis, 2007; Rogers , 1995).

Rogers (1983) categorised innovation adopters based on their attitude towards the adoption. Innovators are the earliest to embrace innovation and are considered venturesome. They are followed by early adopters, early majority who adopt after lengthy deliberations, then the late

majority who are described as cynical and the later to adopt are the laggards who are often traditional and conservative (Schaller, 1972; Berkun, 2010).

3.3.1   Types of Innovation

The type of innovation, the resources and the core competencies required for its diffusion influence the innovation diffusion decision process (Gilbert & Cordey-Hayes, 1996). Among the types of innovation are;

i.   Technical innovations; these consist of the tools and methods of operations used to transform raw materials or information into products or services (Greenhalgh et al, 2005; Berkun, 2010).

ii.   Administrative innovation is the type of innovations which are associated with the introduction of a new management structure, administrative process, or staff development scheme which indirectly influences the introduction of products or services or the process of producing them (Gilbert & Cordey-Hayes, 1996).

iii. Incremental innovation is an extension or modification of existing products, services or process of producing and provisioning of services. This type of innovation is largely influenced by the marketplace and is expected to utilise the existing internal competencies by providing them the opportunity to build on existing know-how (Darroch, 2005; Darroch & McNaughton, 2002).

iv.   Radical innovations, on the other hand, are often disruptive and potentially expertise-destroying that may render existing skills and knowledge redundant (Darroch & McNaughton, 2002). Radical innovations require different management practices and likely to emerge from scientists and research institution; they are mostly technology driven innovations and are difficult to diffuse (Plessis, 2007).

v.   Preventive innovations are adopted to reduce the chance of some unwanted future event and are diffused more slowly than incremental (non-preventive) innovations (Rogers, 1986).

3.3.2   Types of Innovation Decisions

Innovation and its impact on the organization and the individuals within the organization influence the innovation decisions (Rogers, 1983). Rogers (1995) categorised innovations into;

i. Optional decisions; this is where the adoption or rejection of an innovation is dependent on an individual's independent decisions among the members of an organization (Rogers, 1995).

ii. Collective decision; a situation where adopting or rejecting an innovation is a consensus decision among the members of an organization or among organizations in a system (Rogers, 1995).

iii. Authoritative innovation decision; this is where the decision to adopt or reject an innovation is made by a group or individuals in an organization with authority which emanates from expertise or status (Knol & Stroeken, 2001).

iv. Contingent innovation decision; this is where two or more types of innovation decisions are made to adopt or reject an innovation only after a prior innovation-decision (Rogers, 2003).

3.3.3 Factors Influencing Innovation Diffusion

The Social system of an organization could sway the innovation decision process. The social system of an organization consists of the organizational members and their relationships as well as rules, norms, roles, procedures and structures. It also includes the level of interaction among the members of the organization and between the environment and the organization's members (Damanpour, Szabat, & Evan, 1989).

The social and communication structure of an organization could also affect diffusion of innovations within it and its environs. The key aspect of a social system is the established behaviour patterns for the members such as the existence of opinion leadership, change agents and aides (Damanpour & Gopalakrishnan, 2001).

Opinion leaders are individuals with the ability, informally and overtly, to influence the attitudes and behaviours of others in a desired way with relative frequency within an organization. Change agents are persons who provide critical leadership for affirmative decision for innovation (Rogers, 2003) while aides are change agents who intensively contact clients to shape their innovation decisions. The last social system influence on innovation diffusion concerns consequences on individuals or an organization resulting from the adoption or rejection of an innovation (Rogers, 1986; Shih, Kraemer, & Dedrick, 2008).

Time is crucial in the diffusion process, innovativeness and the rate of adoption of an innovation. An innovation decision refers to the time an individual or organization passes

through the innovation-decision process. Early adopters normally take a short time to make innovation decision (Damanpour, Szabat, & Evan, 1989).

The communications channel for an innovation also has a significant impact on its diffusion (Rogers , 1983). The process by which an innovation gets to the receivers from the source can be through either interpersonal or mass media channels while innovation information originates from localite or cosmopolite sources (Frambach & Schillewaert, 1999; Rogers , 1983).

Mass media are critical at the knowledge stage by providing a medium for a wider audience. Interpersonal interaction allows for face-to-face exchange between two or more individuals (Rogers, 2003). This interaction is essential for the persuasion stage with cosmopolite channels being essential at the knowledge stage while localite channels are more appropriate at the persuasion stage. While mass media and cosmopolite channels are more beneficial to early adopters, interpersonal channels and localite channels are better for late adopters (Zhu, Kraemer, & Xu, 2006).

3.3.4 Attributes of innovations and their influence on the rate of adoption

The adoption of an innovation is determined by the perceived attributes of the innovation by the members of a social system especially the decision making unit (Rogers, 2003; Shih, Kraemer, & Dedrick, 2008; Morone & Taylor, 2001). Promoters of an innovation must learn how the potential adopters grasp new ideas. This would help determine of the innovation diffusion process to adopt (Gopalakrishnan & Bierly, 2001).

An innovation must;

i. Have a comparative advantage over the status quo. The perception of the relative advantage of an innovation by the members of a social system directly relates to its rate of adoption (Watson, 1997; Gopalakrishnan & Damanpour, 1994).

ii. Be compatible with the existing values, norms, skills, past experiences, or needs of potential users. Perception of compatibility of an innovation by members of a social system is directly related to its rate of adoption (Rogers , 1995; Rizvi, 2008).

iii. Not complex and too difficult in comprehending and using it. The more complex members of a social system perceive an innovation, the slower the speed of its adoption (Rogers , 1983; Crum, Premkumar, & Ramamurthy, 1996).

iv.   Be trialable so that it could be piloted or experimented on a limited scale. There is a positive relationship between perceptions of the trialability of an innovation by members of a social system and its take up rate (Venkatesh et al, 2003).

v.   Be observable and palpable. Members of a social system's perception of the observability of an innovation directly relates to its rate of adoption (Damanpour, Szabat, & Evan, 1989).

3.3.5   Diffusion Strategies: Centralized versus Decentralized diffusion

Approaching innovation diffusion from a centralised or decentralized perspective could have a significant impact on the rate of and the level of its adoption. This dichotomy may be an oversimplification since many a diffusion system combines the elements of both centralized and decentralized diffusion techniques (Berkun, 2010; Rogers, 2003). A decentralized diffusion system is characterised by decision units or adopters making decisions on the management of the diffusion process. This strategy is employed where there is the required professional and technical expertise within the organization or where the innovation does not require high level professional and technical competencies for its diffusion process (Rogers, 1986). A centralized diffusion method alternatively follows a linear, one-way model of communication with a central authority spearheading the innovation. The table below outlines the characteristics of these two approaches (Rogers, 1983).

Table 3-1: Centralized Versus Decentralized Diffusion Systems

Diffusion Characteristics	Centralized Diffusion System	Decentralized Diffusion System
Decision Making and Power	National Government and Technical/Subject-matter Experts	Members of the Diffusing system, Local Official and Leaders
Direction of Diffusion	Top-down, from experts to Local Users	Peer Diffusion through Horizontal networks
Sources of Innovation	R&D, Technical Experts	Local experimentation and skill by the local user experts, non-experts
Decision of Innovation to Diffuse	Top Administrators and Technical Subject-Matter Experts	Local Units based on Evaluation
Drivers of Diffusion Process	An Innovation Centred Approach, Technology Push, Availability of Innovation	Problem-Centred Approach, Technology Pull, Locally perceived needs and problems
Level of Adaptation	Low level of Local Adaptation and re-invention of innovation by Adopters	High Degree of Local adaptation and re-invention as they diffuse among adopters

Adapted from (Rogers , 1983)

Unlike centralized systems, a decentralized diffusion approach would probably fit with adopters' needs and problems more closely thus creating a sense of control. Adopters assist in making critical decisions including identification of serious problems, refinement and implementation issues (Rogers, 2003).

However, a decentralized diffusion process could face serious problems when there is lack of technical expertise to inform decisions on the required innovations to diffuse and to adopt. In situations where innovations being disseminated require a high level of technical expertise, a more centralized approach would be appropriate (Rogers, 1995; Damanpour & Schneider, 2006).

Furthermore, a highly decentralized approach to diffusion faces the problem of coordination with local adopters lacking information about what is happening elsewhere in the social system. Also in situations where possible adopters do not see a need for an innovation, a more centralized approach would be appropriate (Rogers, 1986; Rogers, 1995).

3.4   The Diffusion of Innovation Theory in Information Systems Research

The diffusion of ICT in public administration and, for that matter E-government, continues and would continue to create value for individuals, organizations and governments willing to accept, reengineer and adopt its utilization (Venkatesh et al, 2003). Technological, economic and organizational factors have been identified as encouraging or hindering innovation adoption by individuals or organizations as indicated by Tornatzky & Fleischer (1990) and Moore &Benbasat (2001). The Diffusion of Innovation Theory has been applied and adapted to different areas of information system research. There are consistencies in the findings of various studies that technical compatibility, technical complexity, and comparative advantage significantly influence the diffusion and adoption of innovations (Bradford & Florin, 2003; Jeremy, 2001).

The initiation phase of diffusion is when an organization becomes aware of, shapes opinion and attitudes about and evaluates an innovation while at the implementation stage, the organization decides to acquire and deploy the innovation (Damanpour & Gopalakrishnan, 1998; Damanpour & Schneider, 2006). The diffusion of E-government could therefore, be deemed a success only if it has been accepted and assimilated into and improved government and governance (DiMaggio and Powell, 1983; Fichman& Kemerer, 1999).

Understanding the factors contributing to successful diffusion of technology in public sector organizations is complex (Gilbert & Cordey-Hayes, 1996). The innovation diffusion theory

has been criticized for being biased towards innovation. This is because a large number of innovation diffusion researchers conclude that an innovation should be diffused and adopted by the society (Tolbert & Zucker, 1983).

There is also the seeming consideration of individuals being responsible for the adoption of the innovation rather than the institution or the system of which the individual is a member. With these criticisms in mind, this research would thus consider other theories as complementary in explaining the diffusion of innovation to facilitate the answering of the questions posed for the research. The complementatry theories identified to strengthen the theoretical foundation of this study are The Technology-Orgainzation-Environment (TOE) Framework, The Stakeholder Theory and the Institutional Theory.

3.5 Technology-Organization -Environment (TOE) Framework

Tornatzky & Fleischer's (1990) Technology-Organization-Environment (TOE) framework for technology innovation diffusion of provides a framework for studying organizational adoption of technological innovations. The TOE framework identifies three institutional contexts which influence the adoption and implementation of technological innovations. These are; the technology being diffused, the organization that is diffusing such technology, and the environment in which the technology is being diffused (Tornatzky & Fleischer, 1990; Tornatzky, Fleischer, & Chakrabarti, 1990). Whether organizations recognize the need, search for, evaluate and adopt a new technological innovation is influenced by these factors. Figure 3.2 illustrates the various technological, organizational and environmental factors that influence the successful diffusion of technological innovation.
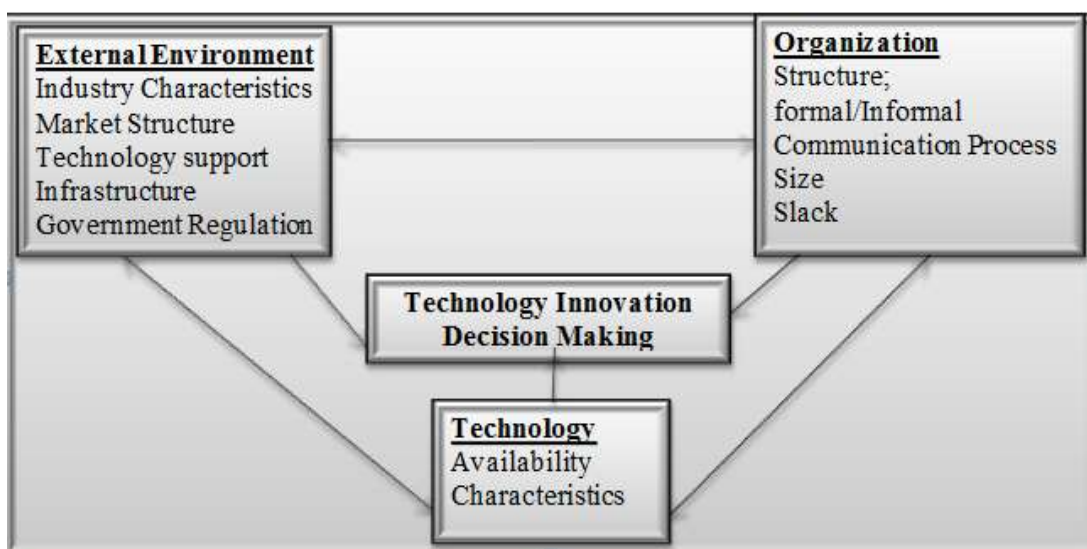
Figure 3-2: The TOE framework (*Adapted from (Tornatzky & Fleischer, 1990)*)

The TOE framework has matured and gained considerable empirical support with the three contextual factors either found to be providing opportunities or constraints for technological innovation and thus influencing an organization's wish to adopt an innovation (Tornatzky & Fleischer, 1990; King et al, 1994). It has been extensively used in various forms in information systems research especially in e-business and e-commerce domains such as in Benbasat & Dexter (1995), Frambach & Schillewaert (1999), Kuan & Chau (2001) among others.

The technological factors outline the availability and relevance of the technology in terms of equipment and processes available to the organization both internally and externally (King et al, 1994; Kuan & Chau, 2001).

The organizational factors look at the characteristics of and the resources available to the adopting institution. Among these factors are the size, the structure of decision making process and management, degree of formalization and centralisation, availability and skills of manpower, amount of slack resources and the level of interactions among members (Kraemer, Zhu, & Xu, 2002; Kuan & Chau, 2001; Pan & Jang, 2008).

The environmental factors refer to the type, size and structure of the industry in which the organization is operating, its competitors and collaborators, the level of interactions among separate entities and its stakeholders, the economic conditions as well as regulatory regimes (Tornatzky and Fleisher 1990; Kuan & Chau, 2001; Pan & Jang, 2008).

Kuan and Chau (2001) identify six factors as predicting technological innovation adoption in their modified TOE Framework. In the perception-based TOE framework, direct benefits, indirect benefits, cost, technical competence, industry pressure and government pressure are identified as influencing the adoption of technological innovations (Kuan & Chau, 2001).

There is therefore, ample evidence of the usefulness of the technology-organization-environment (TOE) framework for studying the adoption of technological innovations. Henriksen (2006) in a similar study on the adoption of inter-organizational information systems (IOS) in the Danish steel and machinery industry utilised the TOE framework and identified environmental and organizational contexts more than technological factors as determining the adoption of IOS in Denmark.

The technology-organization-environment (TOE) framework has been applied in different studies and gained grounded theoretical basis. It has been consistently validated empirically using different constructs (Fichman, 1999). The growing interests in the diffusion of e-government in developing countries such as Ghana would thus benefit from the application of the TOE framework to identify the factors that would facilitate successful diffusion as well as identify the challenges therein.

3.5.1 TOE Framework in E-government Research

The diffusion of E-government in developing countries requires the re-engineering of the existing traditional governance systems and government structure with their associated manual processes and rigid bureaucracies through the infusion of information and communication technologies (Fichman, 2004; Devaraj & Kohli, 2003).

However, information and communication technology diffusion in itself may not result in the effectiveness and the expected transformation through E-government. Chatterjee et al. (2002) among other studies have unearthed key organizational factors such as commitment and support of top management and inter-departmental coordination as facilitating the diffusion of E-government in developing countries (PCIP, 2004).

Moreover, environmental factors such as the adoption of E-government by peer departments, the private sector, regulatory requirements, donor requirements and lessons from other countries are all thought to influence the diffusion of E-government in other developing countries (Fine, 1986; Zhu et al, 2006). Differences in the level of diffusion of E-government among government institutions could thus be attributed to the disparity between resource availability and the external environments of the institutions (Frambach & Schillewaert, 1999; Knol & Stroeken, 2001). Even in countries where the level of diffusion is moderately high, the above factors could also contribute to the gap between diffusion and assimilation (Fichman & Kemerer, 1999). Over a decade of the adoption of various ICT policy for Accelerated Development (ICT4AD) by many a developing country such as Ghana, there are visible gabs between the diffusion and assimilation of e-government (Bwalya, 2009).

To reduce the assimilation gap, E-government policies and strategies must be accepted by the users, adapted where necessary to suit the user and the institutions, routinized in the service or production process and institutionalized (Scott, 2006). In the initial adoption of E-government, users and other stakeholders might lack the requisite knowledge to leverage the system, and this often results in misalignments between the latest technology and the user environment (Kuan & Chau, 2001; Zhu, Kraemer, & Xu, 2006).

It is for the above reasons that this study is adopting a multi-theory analysis of E-government diffusion in a developing country. The consideration of Institutional Theory in the next section provides complementary understanding of the institutional factors that influence socio-technological innovation diffusion such as E-government. This would strenghen the theoretical support of the model being proposed for the assessment of E-readiness of government ministries, department and agencies in the local government areas for not only diffusion but also institutionalization of E-government to ensure decentralised delivery and access to government services.

Although the TOE framework provides a strong theoritical understanding of the adoption and diffusion of technology, the grouping of stakeholders in the environment limits the ability of the framework to identify the types of stakeholders in the environment, their needs and their power to influence the diffusion process and to attend to their concern in the diffusion process. Again the organizational factors fall short of analysis of critical and compelling institutional factors that influence the diffusion of technology in organization. To compensate for these shortcomings, the Institution theory and the stakeholders theories are used to strenghen the study and the proposed model for E-readiness.

3.6   Institutional Theory and E-government Diffusion

An institution could be defined as a social entity that exerts influence and control over other social entities (Zucker, 1987). North (1990) considers institutions as human constraints structuring human interaction. These constraints could either be formal such as laws and regulations or informal regulations such as customs, norms and cultures (North, 1990; Peng, 2003).

Institutions are made up of three main pillars namely; regulative, normative and cognitive (Scott, 1987). Regulative pillars emphasize on the systems' formal rules and the mechanisms for enforcement as authorised by the state (North, 1990). Normative pillars define the appropriate means of pursuing valued ends (Scott, 1987; Sott, 2008), whilst cognitive pillars are the beliefs and values taken for granted that are forced on or adopted by social actors (DiMaggio & Powell, 1983; Dacin, Goodstein, & Scott, 2002).

There are therefore, compelling institutional factors that shape innovation in general and innovations in governance in particular. Government policies could be described as a microcosm of a broader set of institutional concerns, of which governmental institutional factors form an indispensable part (Montealegre, 1999). Governmental institutions thus play vital roles in the diffusion of E-government innovation. The institutional approach to this

study offers significant insights into the importance of the institutional environment, the structures and the actions on the diffusion of E-government innovation (Damanpour, Szabat, & Evan, 1989) and their applicability in the context of a developing country

Institutionalists contend that in societies where organizations are characterized by rationally ordered rules and activities, organizational practices and policies become readily appreciated as a legitimate and practical tool for the achievement of organizational objectives (DiMaggio & Powell, 1983; Tolbert & Zucker, 1983). Therefore, in the competitions for resources and social fitness, there are varieties of social conceptions of what constitute an acceptable and appropriate form of organizing the activities of an institution (Zucker, 1987).

Institutions are often compelled to adapt to appropriate forms and behaviours to avoid the questioning of their legitimacy and being starved of resources and social support (DiMaggio & Powell,1983; Scott, 1987). Institutions are also expected to be isomorphic with their environment in terms of interconnectedness and structural equivalence (Burt, 1987; Kondra & Hinings, 1998). Interconnectedness defines the relationship between organizations in terms of transactions with one another while structural equivalence refers to the occupation of similar position in an inter-organizational network (Kondra & Hinings, 1998).

DiMaggio & Powell (1991) identified three types of isomorphic pressures on institutions. These are coercive and normative pressures that are applied through interconnectedness, and mimetic pressures which are applied through structural equivalence. Since most government institutions have structural similarity, one would expect that mimetic pressures would be brought to bear on the department and agencies occupying similar economic and socio-political status with similar goals, customers, suppliers, experiences and constraints to diffuse E-government (Burt 1987).

Coercive and normative pressures could also influence the adoption of E-government since government institutions, departments and agencies are interconnected in one way or the other (DiMaggio & Powell,1983). Government institutions might also mimic other organizations to acquire status-conferring legitimacy or social fitness in a wider social structure regardless of the value of a practice or innovation (Teo, Wei, & Benbasat, 2003).

Tolbert and Zucker (1983) therefore, identified technological and economic needs as drivers for early adoption of public sector reforms. Late adopters are on the other hand driven by social legitimacy, which requires improvements in organizational structure, efficiency or citizens' needs. This could be applied to the diffusion of E-government in the developing countries (Tolbert & Zucker, 1983).

In the adoption of administrative innovations such as E-government that involve actual examination by an external agency, organizations may instead accommodate institutional demands by conforming to socially acceptable operational definitions of institutional goals (DiMaggio & Powell, 1991). This scenario applies to many organizations in institutional environments in which external legitimating agencies may hold tight and intrusive controls (Tolbert & Zucker, 1983).

Institutional effects of innovation can be categorised into pre-conscious and post-conscious institutionalizations (Scott,1987). Pre-conscious institutionalization is the situation where an organization functions and makes decisions in environments where much is taken for granted. These taken-for-granted elements, according to post-conscious institutionalisation, consist of solid drivers in the organization's environment and could divert planned adoption away from the proposed comparative advantage (McAdam et al, 2012).

Pre and post conscious institutionalization may be viewed in the context of normative and cognitive expectations (Scott,1987). Cognitive expectation constitutes what are the right and appropriate actions since choices of which technology and how such technology is adopted are controlled by socially-mediated values. Normative expectations on the other hand, are grounded in the logic of appropriateness or what is expected of the organization in the case of e-government, the efficient and effective delivery of government services as well as bringing governance closer to the citizens through technologically-mediated environment (Scott, 2003).

Normative expectations are pre-conscious where organizational actors may just be unaware of possible alternatives of doing things (Kondra & Hinings, 1998). However normative expectations become post-conscious where organizational actors become aware of the need to change, but actively consider only a limited range of alternatives, each of which is acceptable within the existing institutional setting (Zucker, 1987; Scott,1987). After a decade of the donor-driven ICT policies in many developing countries, it is important to identify whether the normative expectation of E-governance is pre-conscious or post-conscious.

It is believed that where competitive pressures are weak or absent among organizations as pertains in government institution in developing countries, the level of efficiency can become extremely low, and organizations may proceed with comparatively inefficient designs, perhaps indefinitely (Kondra & Hinings, 1998) as is still visible in a number of developing countries such as Ghana (Kovačić,, 2011).

As innovations become institutionalized as the acceptable and expected elements of the organization, its benefits become increasingly social rather than economic or technical and

their diffusion constitute legitimacy rather than improvements (Srinivasan, Lilien, & Rangaswamy, 2002). This study therefore, subscribes to the idea by Gilbert & Cordey-Hayes (1996), that mimetic, coercive, and normative pressures could influence organizational tendency towards E-government diffusion in developing countries through cascading processes.

3.6.1 E-government Institutionalization Processes

The transformative capabilities of E-government can be realised only if the process of its institutionalization is in tandem with accepted practices and the organizational objectives (Montealegre, 1999). The E-government institutionalization process must go through a number of phases to ensure successful outcomes.

i. Problem identification and solution finding. The realization by government institutions that the existing process of delivering government services is ineffective and fraught with inefficiencies would signal the need to find a solution through E-government. Government institutions could seek solutions in the enhanced information processing, communication and service delivery capacity provided by the deployment of information and communication technologies in such institutions (Yang, 2003).

ii. Building competence: Once the problems are identified and E-government is seen as the solution, the need for the formation of project teams to evaluate and conceptualize such solution is essential. Finally the implementation of the systems could be done either through pilot phases or a prototype. The adoption and continued expansion of usage would depend on the achievement of the solution to the problems identified and organizational objectives (Kim, Kim, & Lee, 2009).

iii. Solution Expansion: The realisation of the potential of E-government as a result of the initial implementation could result in the appreciation of its transformation capabilities and could culminate into searching for partners with expertise and resources to build and develop solutions which are robust and state of the art technology. The project could then grow to exert some degree of control over varied institutions (Tolbert, Mossberger, & McNeal, 2008).

iv. Enabling changes: The functional model emerges as E-government systems which are capable of improving efficiency and effectiveness in government services delivery as well as significant cost reduction. This could culminate into sustained efforts to exploit the productivity of information and communication technology and

provide significant conditions for the augmentation of E-government diffusion (Kim, Pan, & Pan, 2007)

v.   Evolving strategy: As E-government solutions evolve, stakeholders would begin to demand continuous improvement in the quality of service and an easy way of accessing government services. This would eventually lead to the expansion of the original design and the improved system's capability could trigger another round of ICT innovation (Rajendra & Best, 2006).

The process of E-government diffusion and institutionalization can strongly be influenced by regulative, normative or cognitive pressures as posited by Scott (2008).

3.7   Institutionalization of E-government: the Critical Success Factors

Successful diffusion and institutionalization of E-government requires six institutional actions (Fulk,1993; Montealegre, 1999), namely;

i.   Knowledge building which consists of the institutional actions undertaken to provide the basis of scientific and technical knowledge required to create and exploit E-government innovation (Montealegre, 1999).

ii.   Knowledge deployment involves stimulation and propagation of the innovation among individuals and organizations through education and awareness creation to promote the use of innovations. This can also be done through the training of potential users of E-government services (Darroch & McNaughton, 2002).

iii. Subsidies are institutional actions designed to provide accurate innovation outcomes such as funding of prototype development and demonstration projects. External users of an innovation could also be subsidized or the cost of training for potential users could be absorbed so as to reduce the barriers to diffusion and institutionalization of E-government (Darroch, 2005).

iv.   Mobilization refers to institutional actions that promote decentralized actors to view an innovation in a particular manner. This could be done by encouraging institutional interventions in the diffusion and adoption of E-government innovation through promotional and awareness campaigns (Flak, Nordheim, & Munkvold, 2008).

v.   Setting standard involves putting up guidelines which are enforceable on independent actors and institutions in line with larger social or institutional objectives (Fulk, Schmitz, & Ryu, 1995).

vi.   Innovation directives are institutional actions requiring institutions to foster innovation, diffuse and exploit innovation. Innovation may require the diffusing

institutions to adapt their structures and operations in ways that indirectly affect innovation and its diffusion (Montealegre, 1999).

The rapid developments in information and communication technologies create the uncertainties about the appropriateness of various government policies, legal and regulatory framework, to accelerate the diffusion of E-government in developing countries. It is thus, necessary to gain an academic and expert insight into institutional factors influencing innovation diffusion in general and ICT innovation in particular.

3.7.1 Institutions Influencing ICT Innovation

According to King et al (1994), various institutions play significant influential roles in the diffusion and instituionalization of information and communication technology innovations into E-government in one way or the other. Among the identified institutions are:

i. Government authorities. These include national government agencies, provinces, Prefectures, states, municipalities and governmental authorities that can influence the policies of another sovereign state. Government authorities assume a powerful and unique advantage of legal powers and create the structure governing the operations of other institutions (Fichman, 2000).

ii. International organizations such as the United Nations, the World Bank and the International Monetary Fund, International Telecommunication Union can influence ICT innovation (Santiso, 2001).

iii. Domain expert associations, trade unions, scientific and technical societies, civil society organizations as well as research-based educational institutions could also influence the diffusion of E-government (Gurbaxani et al, 1990).

iv. Trend-setting corporations and institutions. Powerful domestic companies performing critical functions can drive innovation while multi-national corporations who are cross-national companies could affect the transfer of technology where they operate (Gurbaxani et al, 1990).

v. Financiers of the innovation creation process and labour organizations can also influence the diffusion and utilisation of certain innovations in specific industries.

vi. Religious authorities can also raise ethical questions regarding the deployment and the use of technology in certain circumstances (King et al,1994; Fine, 1986).

The diffusion of E-government in developing countries has largely ignored these institutions in the planning and development of the strategies. This study thus predicts that these

institutions largely influence the level readiness of government ministries, departments and agencies to adopt E-government.

3.8   Stakeholder Theory and Analysis for E-government Diffusion

The stakeholder theory is as descriptive as it is instrumental. It describes the relationship among competitive interests with intrinsic values as well as establishing the framework for the study of connections and relationships between stakeholder management and the achievement of organizational objectives (Jones & Wicks, 1999).

Groups of people or individuals who can influence the achievement of an organization's objectives are considered to be stakeholders (Freeman, 1994). The modern stakeholder theory is dual faceted; the first involving the interpretation of stakeholder and the second providing a classification of stakeholders to facilitate an understanding of individual stakeholder relationships (Rowley, 1997).The stakeholder relationship theory presumes an organizational adaptation to a position other than the preferred option especially where decision are made based often on conflicting interests and concerns (McAdam et al, 2012).

3.8.1   Classification of Stakeholders

The importance of stakeholder classification is to highlight which stakeholders could have a significant impact on an organizational change process so as to manage them (Donaldson & Preston, 1995).

Stakeholders can be categorised into primary and secondary by considering their direct or indirect impact on the organization (Frooman, 1999). Donaldson and Preston (1995) identify normative and instrumental stakeholder relations. While normative relations are concerned with how organizational stakeholders should be dealt with, instrumental relationship considers stakeholders as part of the organizational environment that should be managed to achieve organizational values (Freeman, 1999). Phillips et al (2003) describe normative stakeholders as a group or individuals to whom an organization has moral obligations, while derivative stakeholders are able to influence the direction of the organization in some way, but the organization has no moral obligation towards such entities (Jawahar & McLaughlin, 2001).

Those stakeholders who possess the power, legitimacy and urgency to alter the course of E-government implementations could be referred to as salient stakeholders (Friedman & Miles , 2002). The attributes of salient stakeholders are not static and they influence how an organization should relate to them (Post et al., 2002; Berman and Wicks, 1999; Elias et al., 2002).

Tipping et al (1995) explicitly recognised the importance of stakeholder analysis in technology development and diffusion by noting the variation in interests and perspectives among information and communication technology innovation stakeholders. The identification and mapping of key issues and stakeholders as well as the potentially dynamic nature of stakeholders' salience is thus critical in the diffusion process of ICT-enabled innovations such as E-government (Avgerou, 2010; Choudrie, Papazafeiropoulou, & Lee, 2003).

E-government diffusion affects different stakeholders in different ways. As an innovative process, it has stakeholders who are within it and those who are not (Gupta, Dasgupta, & Gupta, 2008). While those within it have similar interests, claims and rights, those outside it are often motivated by different values and objectives and are almost impossible to identify as salient (Hall & Martin, 2005; Heeks, 2006). Effective analysis of stakeholders is a sine qua non for E-government diffusion since it has profound socio-political as well as economic implications (Hall & Vredenburg, 2003; Donaldson & Preston, 1995).

Diffusing innovations such as E-government is often beset with the problems of managing all stakeholders' concerns and pressures (Hall & Vredenburg, 2003) in order to allay their fears and minimise both anticipated and unanticipated adverse impacts (Bradford & Florin, 2003). Excessive widening of stakeholder analysis for E-government implementation could be a hindrance to the successful implementation as in any innovation diffusion (Gatignon et al, 2002).

However, the recognition of all stakeholders may provide the interacting variables that must be considered (Hall & Martin, 2005; Hall & Vredenburg, 2012); especially where stakeholders belong to different social and economic strata with irreconcilable differences based on moral, religious, cultural or social issues as found in many a developing country who are diffusing E-government (Clarkson, 1995).

3.8.2   Identifying E-government Stakeholders

Stakeholder analysis in E-government diffusion is extremely valuable. It is the means by which managers can identify and address the key concerns of those who would be affected by the potential changes (Miles, Munilla, & Darroch, 2006). It is also necessary to recognise that some stakeholders have differing needs and these differences can lead to conflicts in implementing E-government, hence there is the need for efficient strategies to address such stakeholder needs (Flak, Nordheim, & Munkvold, 2008).

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Stakeholders of E-government implementation may be the citizens, workers unions and civil society organizations. Trade unions and civil servants might oppose full diffusion of E-government because of the fear of potential job losses and the loss of power especially in developing countries where civil servants wield a lot of influence in the delivery of government services (Hall & Martin, 2005). Potential users might also pose challenges to the effective diffusion of E-government especially if the diffusion processes assume users as passive receivers of E-government innovation (Hansen, Grosse-Dunker, & Reichwald, 2009). The stakeholder approach to E-government diffusion, therefore, looks at groups and individuals who could influence the implementation outcome both negatively and positively. This would help identify the diffusion and management strategies needed to address stakeholder concerns (Ayuso et al, 2011).

To develop effective management of stakeholders in E-government implementation, Frooman (1999) posed very relevant questions which could be relevant in the quest to implement E-governance in the developing countries such as Ghana with heterogeneous languages and cultures;

i. Who are the stakeholders in the diffusion of E-government, their classifications and their attributes?

ii. What are the stakeholders expecting from E-government diffusion and how to meet such expectations?

iii. What are the tools and powers available to them to achieve their objective and how salient are they? (Freeman, 1999; Frooman, 1999).

The stakeholder theory is rarely used in the study of E-government diffusion (Rowley, 1997). The E-government research field is often criticized for weak theoretical groundings of the many assertions made about it (Grönlund, 2005; Scholl, 2006). There is therefore, the need for expanding the basis of appropriate theories in the E-government field (Grönlund & Andersson, 2006) to provide the needed clarification and understanding of the current developments in the field (Grönlund, 2004; Flak, Nordheim, & Munkvold, 2008), although Heeks (2001) warns of the dangers of excessive application of the theories and methods developed to fit the private sector directly to E-government contexts.

3.8.3 Stakeholders Management in E-government Diffusion

The diffusion of E-government has moved beyond being a mechanism of ensuring efficiency and effectiveness of government service delivery or an emulation of private sector services delivery (Grant, 2002). It has become a central theme of public sector reforms throughout the

world which requires a detailed understanding of the demands of government organizations, businesses and citizens from a stakeholder perspective (Freeman, 1984). This is because citizens, both corporate and individuals as well as organizations both governmental and non-governmental, are the main interacting variables of governments (Tan, Pan, & Lim, 2005; Tan & Pan, 2003).

These stakeholders, regardless of their power, could lay claim on government's attention, resources and outputs and are affected by that output (McAdam, Hazlett, & Casey, 2005; Bryson, 2004). E-government must thus create value for the identified stakeholders (Alan &Gilfillan, 2003) by improving and meeting their expectations (Srivastava & Teo, 2007). Further, governments often operate at various levels; hence the effects of E-government should also be felt at local, state, and federal (central) levels of governments (Srivastava, 2011).

E-government and E-governance encompass more social dimensions of e-democracy and e-participation with increased stakeholders' involvement in governance (Torres, Pina, & Royo, 2005). E-government as a concept thus incorporates;

   i.   Transforming government's processes by driving widespread participation with open, transparent government through improvement of communication between stakeholders (Wong, Fearon, & Philip, 2007).

   ii.   Fundamentally redesigning the interaction between government and its stakeholders such as other government departments, citizens, businesses and employees as well as between citizens (Torres, Pina, & Acerete, 2005).

   iii.   Transforming society through the emergence of e-societies and e-participation by networking relationships between citizen, non-governmental organizations (NGOs), civil society organizations, business organizations and government institutions (Tan et al. 2005).

E-governance diffusion must therefore incorporate stakeholder management with the identification of key stakeholders, understanding and appreciating their interests and concerns and aligning them in the framework of diffusing E-government (Wong, Fearon, & Philip, 2007).

CHAPTER 4

4   RESEARCH METHODOLOGY

4.1   Introduction

This chapter presents the research methodology used for the study. It discusses various research approaches, designs, strategies and methods with their characteristics, suitability and the context of their applicability. The various methods used in this study are thus presented, justifying each in the context of the research.

4.2   The Research Methodology

This research methodology is the approach and the procedural framework within which this research was conducted (Neuman, 2007). A research is a systematic process of investigation for the purpose of exploring and discovering knowledge on the happenings in the society, science or nature (Patti, 1986). It is the procedure through which a question is answered or a problem resolved systematically with the support of verifiable facts (Walliman, 2001).

Research methodology is thus a systematic and scientific way of solving a research problem detailing the various steps adopted in studying the research problem along with the logic behind them (Blaxter, Hughes, & Tight, 2010). Research methodology is multi-dimensional and includes research (Kothari, 2004).

The appropriateness of the research methodology used has a significant impact on the quality of results obtained from a study. Hence in choosing the methodology for this study various factors were taken into consideration (Walker, 1997). Among these factors are; the research purpose, the group to be studied and the study variables, nature and kind of data to be collected and the type of data analysis (Walliman, 2001). The role and the experience of researcher, the focus of the study, the nature of observation and the final report to be written were also considered (Galliers & Land, 1987).

The interdisciplinary nature of E-government research made the choice of an appropriate research methodology, strategy and approach rather complex with a topic traversing information systems, public administration and political science studies (Yildiz, 2007). The methodology chosen for this research is thus suitable information systems (IS) research (Furneaux & Wade, 2009) and provides a framework that combines all aspects of knowledge needed for such multi-disciplinary subject (Porto de Albuquerque & Simon, 2009).

4.3 The Empirical Research Design for the Study

A research design is a technical document developed by a researcher and used as a template or a plan for carrying out a research project (Blaikie, 2010). A research design is thus the plan and procedure for the research linking the early decisions from general assumptions to specific methods of data collection and analysis and to the conclusions. It serves as a constant guide throughout the research (Creswell, 2009).

This study is thus designed to follow systematic and logical steps that served as a guide and provide direction in answering the research questions. This research investigates the diffusion of E-government as an approach to decentralization, using Ghana as a case study. The study assesses the E–readiness of local governments for E-government diffusion using a proposed model of assessment through which the factors influencing the diffusion process and the impact of E-government on decentralization were identified.

The design for this study is a modification of a framework described in Blaikie (2010) and Creswell (2009) which was found to be appropriate for the study of this nature. The systematic approach to this research is presented in the figure 4-1 below.
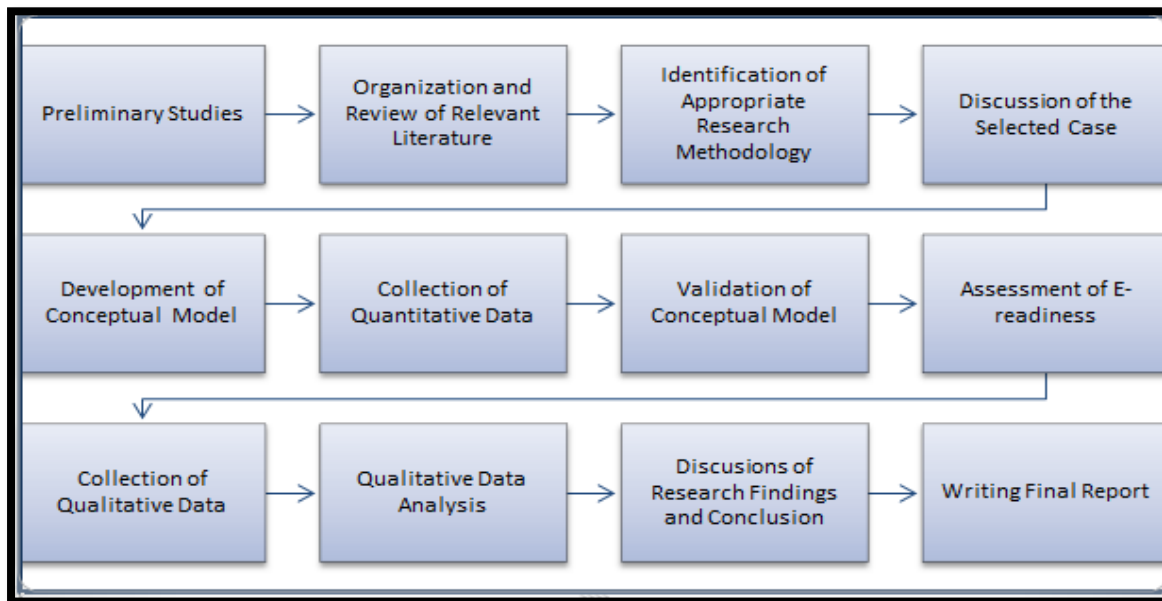
Figure 4-1: The Research Design

A preliminary study was undertaken for the identification of a suitable research topic from the initial broad interest in E-government research. With the identification of the topic for the study, relevant literature was organized and discussed leading to the establishment of the research problems and the generation of research questions and purposes that are appropriate for an applied research as evidenced in Blaikie (2010).

The selected case, the diffusion of E-government in local government in Ghana was then discussed. Given the multi-disciplinary nature of E-government research (Yildiz, 2007), an appropriate research methodology which highlights the relevant research strategy, paradigm, approaches and the research methods comprising data collection and analysis were identified and discussed.

A survey of the relevant literature revealed the need for the development of a model for E-readiness assessment to facilitate the answering of the research questions. Both qualitative and quantitative data were collected in the research process. The quantitative data collected was analyzed and used to validate the conceptual model proposed.

The E-readiness of local government organizations, departments and agencies for the diffusion of E-government was then assessed using the data collected. Qualitative data was then collected and analyzed to answer the other research questions after which there was the discussion of the research findings and the conclusion. The final report was then written (Creswell, 2009).

4.4   Research Strategy

There are different procedures and steps for answering different types of research questions to satisfy the purpose of the study. The strategy for this research provided the logic for answering the research questions. It provided the starting point and a set of procedures by which the research questions are answered (Bryman, 2008). Blaikie (2010) identifies four main research strategies which were evaluated for this study. They are inductive, deductive, retroductive and abductive strategies, each having a relationship with a specific research philosophy and theoretical tradition. They differ in the research questions they answer, the purposes of the study, the starting and concluding points and the steps in between these points (Blaikie, 2007).

Blaikie (2010) postulates that while inductive and abductive strategies are used to answer "what" questions and are therefore useful for exploratory and descriptive types of research, deductive and retroductive strategies are employed in answering "why" questions and are suitable for the explanatory type of research and achieve this through different procedures based on different assumptions (Blaikie, 2010; Bryman, 2008).

This research employs the abductive research strategy. The decision was influenced by the fact that while inductive strategy can be used to answer "What" questions and deductive and retroductive strategies used to answer "Why" questions, the abductive strategy could be used to answer both "What" and "Why"questions (Bryman, 2008). Abductive strategy answers

"Why" questions by producing an understanding rather than an explanation through the provision of reasons rather than causes (Blaikie, 2010; De Vaus, 2001). When coupled with the constructionist version of retroductive strategy, abductive research can deal with the purpose of understanding with a particular ontological and epistemological assumption and logics of enquiry (Bryman, 2008).

Research strategies are used mainly in the context of a research paradigm; some are closely associated with a particular research paradigm while others can be used with a number of them (Corbetta, 2003).

The choice of a strategy is influenced by the researcher familiarity or lack of it of the strategies, certain ontological and epistemological assumption preferences, perceived link between preferred research methods and strategies, preferences of audience and consumers of the research and related politics and series of pragmatic factors such as time, cost and availability of equipment (Easterby-Smith, Thorpe, & Lowe, 2006).

The abductive strategy employed in this study enabled theory construction that is derived from the social actors' language, meanings and accounts in the context of everyday activities. It begins by decribing these activities and provides conceptual understanding of the problem at hand (Blaikie, 2007). Abductive research incorporates what the inductive and deductuve strategies ignore; the meanings and interpretations, motives and intentions that people use daily in their lives which direct their behaviour (Blaikie, 2010).

4.5   The Research Philosophy or Paradigm

This study was undertaken to unearth issues associated with E-government diffusion in Ghana. E-government is a socio-technical endeavor shaped by political, historical and socio-cultural norms (Dawes, 2008). A research of this nature usually employs methodologies which are governed by specific traditional theoretical ideas. These traditions, which have been developed and mutated over time, are referred to as research paradigms (Blaikie, 2010) or research philosophy (Bryman, 2008; Creswell, 2009).

A research paradigm is not a belief but rather the specific means by which a researcher can conceptualize a problem and intervene in certain situations (Vogel, 2012). In this sense, a paradigm directs research efforts, it serves to reassert itself to the exclusion of other paradigms and to articulate the theories it has already established (Krauss, 2005).

The research philosophy adopted for this study is not only the source of its theoretical ideas but also of its ontological and epistemological assumptions. The differences in ontological

and epistemological assumptions are as contentious as their definitions (Bates & Jenkins, 2007).

Ontological assumption describes the nature of reality or the world as it actually exists. It questions whether reality exists only through experience of it (subjectivism), or it exists independently of those who live it (objectivism) (Goertz & Mahoney, 2012). In other words, whether reality can or should be considered a social construction built up from the perception and actions of social actors (Iivari, 1991). Ontological studies, therefore, provide understanding of knowledge (Hirst, 1989).

Epistemological assumptions on the other hand concern the question of what is or what should be regarded as acceptable knowledge in a discipline (Höijer, 2008). Epistemology therefore, questions the quality or nature of knowledge and the optimal process of knowledge acquisition (Goertz & Mahoney, 2012). In other words epistemology considers views about the most appropriate ways of enquiring into the nature of the world, what knowledge is and what are the sources and limits of knowledge (Easterby-Smith, Thorpe, & Lowe, 2008).

Understanding the research philosophies helped in specifying and refining research approach and methods employed in this study such as the type of evidence gathered, the interpretation of such evidence and how it helped in answering the research questions (Easterby-Smith, Thorpe, & Lowe, 2008). It thus improved researcher creativity in the adoption and adaptation of methods which otherwise are not in the researcher's domain (Crossan, 2003).

Bryman (2008) classified research philosophy based on ontological and epistemological assumptions which subsumes Blaikie's (2010) classification into classical and contemporary research paradigms. Epistemologically, a research could adopt positivism, realism or interpretivism while ontologically it could adopt objectivism or constructivism (Bryman, 2008; Blaikie, 2010).

Positivistic epistemology relies on applying the methods of the natural sciences to study social reality (Creswell , 2003). It is based on the principles that;

i.   only phenomena and therefore knowledge that are observable and measurable can be considered as knowledge;

ii.   the purpose of a theory is to produce an hypothesis that can be tested thereby providing justification for the phenomena being assessed;

iii. Knowledge is derived from a collection of facts that are the foundation of laws;

iv.   The conduct of science must and can undoubtedly be done in a manner devoid of value, i.e. value free.

v. There is a clear distinction between scientific and normative statements and that the former are the true domain of the scientist (Bryman, 2008; Creswell 2009).

In contrast to the positivistic orthodoxy, interpretivism is predicated on the view that a strategy is required that respects the differences between humans and the objects of natural science. Researchers are therefore required to understand the subjective implications of social actions (Bryman, 2008) and this requires the use of a different logic of enquiry to that used in the natural sciences (Blaikie, 2010).

Realism which has two strands, empirical and critical realism, share two features of positivism which are the belief that natural and social science research could and must adopt the same approach, and the belief in the existence of an external reality to which scientists direct their attention (Vogel, 2012). It however, departs from positivism by arguing that researchers' conceptualization of reality is simply a way of knowing reality and not actually reflecting that reality (Blaikie, 2010). Realism also concedes that the explanations of theoretical terms are not directly amenable to observation (Bryman, 2008).

Objectivism is based on the ontological assumption that social phenomena and their meanings exist independently of social actors while constructivism argues that such social phenomena and their meanings are continually being accomplished by their actors (Corbetta, 2003). Objectivism views social reality as its inhabitants' product, and meanings are a construction of human beings as they engage with the world they are interpreting (Bryman, 2008; Creswell, 2009). Objectivism attempts to understand a phenomena from the point of view of participants who are directly involved with the particular phenomena (Blaikie, 2010; DeVaus, 2001).

Ontologically this study has some foundation in constructivism (Bryman,2008) which espouses that reality is different and related to the unique understanding and experience of the world and therefore, reality can be subjective (Thompson, 2011) and thus seeks to develop subjective meanings of the understandings of participants (Creswell 2012).The subjects of the study, including the researcher, are influenced by the research. Interpretations therefore, cannot be value-free but are subjective, multiple and complex with the exposition that the knowledge of reality is a social construction by human actors (Greenhill, 2004).

Epistemologically, this study adopted interpretivism with the enquiry process that was guided by the presumptions of the enquirer. There were therefore, contacts between the enquirer and the human subjects of the enquiry, changing the perceptions of both parties (Walsham, 1995). The choice of these worldviews is justified by the intertwining of ontology and epistemology in interpretivism since knowledge is very necessary in the ontological assumptions of the

constitution of the world (Goldkuhl, 2012; Cua & Garrett, 2009).The key feature of information systems research, in which this study is situated, is that knowledge is an understanding through processes of interpretation. The researcher is supposed to interpret the existing meaning systems shared by the actors making interpretivism a bedfellow of constructivist ontology (Crossan, 2003).

Ontologically, this research assumes that the social world, such as the social relationships, organizations and happenings in them, are not given but rather a world produced and reinforced by humans through action and interaction (Orlikowski & Baroudi, 1991; Goldkuhl, 2012). This interpretivist approach assumes a more direct relationship between the ideas the actors hold, the inter-subjective discourses and traditions on which they draw in developing such ideas, and crucially, the institutional and extra-discursive context in which those ideas and traditions come to acquire and maintain resonance (Denzin & Lincoln, 2003). This thus, dispels the view, typically put forward by critics of interpretivism, that it is merely the latest incarnation of idealism (Hay, 2011).
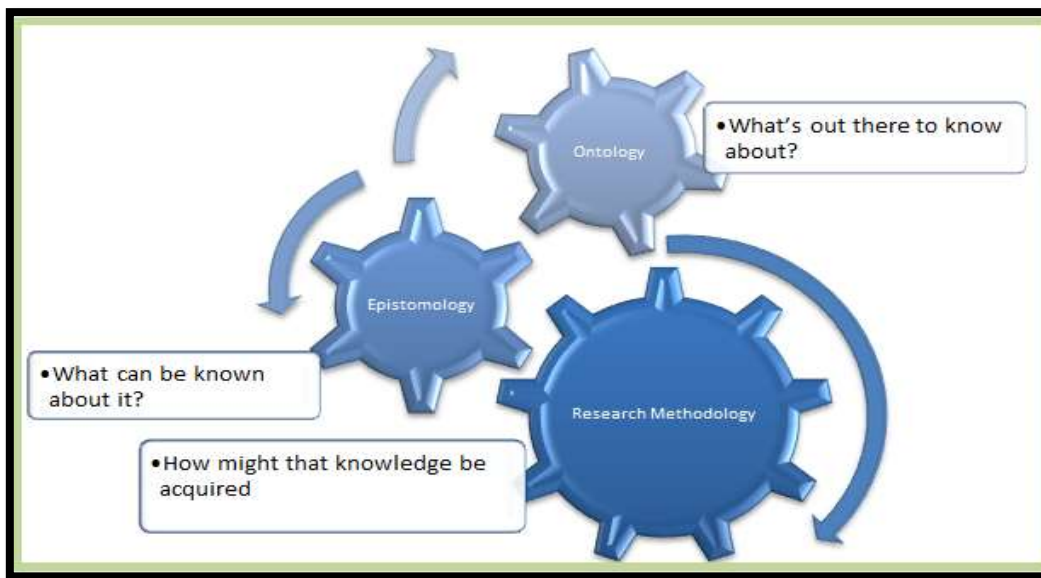
Figure 4-2 Interpretivism Analytical Trinity (adapted from Hay 2011)

4.6 The Research Approach

Research approach is explained as the systematic and logical steps taken towards the collection and analysis of data to obtain information for a study (Williams & May, 1996). Blaikie (2010) identified three main research approaches namely quantitative, qualitative and mixed-method. The choice of any of these approaches is predicated on the aims and the

objectives of the research as well as the research philosophy or paradigm adopted (Creswell, 2009).

This study utilised the mixed-method approach. To justify the choice of the research approach, the options underlining the differences in their core characteristics are discussed.

4.6.1 Quantitative Research Approach

The quantitative research approach involves the generation of data in quantitative form which can be subjected to quantitative analysis in a formal and rigorous manner (Corbetta, 2003). The quantitative method can be described as an extreme form of empiricism, which relies on the control and interpretation of the phenomenon under study (Creswell, 2012).

It is an approach for testing objective theories through the examination of the relationships among variables which in turn can be measured on instruments to obtain numerical data that can be analysed using statistical procedures (Kothari, 2004). It is argued that the quantitative approach to research is more suitable for research problems seeking to identify the factors influencing an outcome, understanding the best predictors of outcomes or the efficacy of an intervention (Creswell, 2009). The performance of tests in a quantitative study requires the operationalization of the methods employed such as survey, laboratory experiment and modelling with the data analysis depending on statistical principles (Corbetta, 2003).

Assessing the E-readiness of the local governments in Ghana for this study required the development and validation of a conceptual model proposed for the assessment and the actual E-readiness assessments. These were therefore, done using quantitative methods of data collection and analysis.

4.6.2 Qualitative Research Approach

Qualitative approach to research deals with subjective assessment of attitudes, opinions and behavior (Yin, 2011). Research in such situations is a function of the researcher's insights and impressions (Corbetta, 2003). This approach provides the avenue for exploring and understanding the meaning individuals or groups ascribe to social or human problems (Golafshani, 2003). It involves emerging questions and procedures with data typically collected in the participants' settings and analyzed inductively; building from particular to general themes and the researcher making interpretations of the meaning of the data (Creswell, 2009).

Qualitative research utilizes varieties of techniques to obtain normally non-quantitative data which are not subjected to rigorous statistical analysis .Among the data collection techniques used in qualitative research are focus group interviews and discussions, individual detailed

interviews, review of documents and participant observation to understand and interpret social phenomena (Myers, 1997). The focus of information systems research is gradually shifting from technological to managerial and organizational issues making the qualitative approach to research increasingly valuable (Kothari, 2004). Qualitative research enables researchers to explore social and cultural phenomena and represent data as narrative and is conducted through intense contact with the field (Greenhill, 2004; Yin, 2011).

The qualitative method has many attributes; most importantly, data collection focuses on events occurring in their natural settings. Well-collected qualitative data could be rich and holistic, with strong potential for revealing complexities (Walliman, 2001). It also contributes to theory, policy making and social consciousness (McMillan & Schumacher, 2001; Yin, 2011). These features help to achieve the goal of understanding rather than predicting the dependent variables. Additionally, qualitative research is conducted through an extensive prolonged contact with the field, which makes it a powerful technique for studying processes (Merriam, 2002).

The qualitative method does, however, have its weaknesses. The complexity and richness of data can complicate the analysis process. More importantly, it leaves the data open to interpretation; both interviewee and researcher prejudice become a real threat (Lodico, Spaulding, & Voegtle, 2006). This is more pronounced in information systems research such as this study since information systems in organization are dynamic and the circumstances keep changing, which could affect the research validity and verification over time (Goldkuhl, 2012; Silverman, 2009).

Qualitative research is preferred when there is little previous research into the phenomenon to be investigated and needs to be further understood (Corbetta, 2003). Many argue that the qualitative method is most appropriate when the main goal of research is to improve the understanding of a phenomenon (Morgan & Linda , 1980). It also helps in understanding how people perceive a problem, based on building a complex and holistic view especially when the research is concerned with organizational processes (Myers, 1997; Creswell, 2012) such as in this study. Therefore, information system researchers have widely utilized the qualitative approach in their various researches (Orlikowski & Baroudi, 1991).

Understanding the impact of e-government diffusion in local government in a developing country such as Ghana, required in-depth interviews where the researcher could sometimes be embedded in the system. Document analysis, which is also essential to identify the impacts and factors that influence e-government diffusion, requires a qualitative approach. Hence, this study also utilized qualitative data collection and analysis to answer some of the questions

posed in this research (Yin, 2011). The qualitative method provided explanations to broaden the researcher's understanding of the phenomena and promoted opportunities of informed decisions for social action (McMillan & Schumacher, 2001).

4.6.3   Pragmatism and Mixed Methods Research Approach

Pragmatism advocates believe that the best way of answering a research question must be used without necessarily being bogged down by the usual quantitative and qualitative arguments (Creswell, 2009). Both qualitative and quantitative methods provide different ways of answering a research question. One of the most commonly used pragmatist approaches for research is the Mixed- Methods approach (Creswell et al, 2006). Quantitative and qualitative designs have dominated research where the choice between the two approaches has seemed to be dichotomous. However, a third option, mixed method approach, is gaining wide acceptance in not only information systems research but research in general (Benbasat, Goldstein, & Mead, 1987).

Mixed methods approach is a combination of quantitative and qualitative research methods in the same research. It involves the collection, analysis and interpretation of qualitative and quantitative data in one or a number of studies to investigate the same underlying phenomenon of interest (Leech & Onwuegbuzie, 2009; Lodico, Spaulding, & Voegtle, 2006). The combination of the two major approaches often complements each other where quantitative or qualitative components may be employed equally or one may dominate (Creswell, 2009). Mixed method is gaining wide usage since there are similarities in some of the tools and techniques employed in the quantitative and qualitative data collection process (Rocco et al, 2003).

The possibility of such combination can take a number of forms;

  i.   Mixing could be at a single point of the research project or at multiple points; from research purpose, statement of research question to data collection and analysis to findings (Denscombe, 2008).

  ii. Mixing could be interactive or sequential utilizing information gained from one approach to draw from the other. It can also be simultaneously done or in parallel proportion brought together during the analysis stage of the research (Mertens & Hesse-Biber, 2012).

  iii. Collection of data and analysis could be mixed between and within levels of individual, group, organization and society (Mertens & Hesse-Biber, 2012).

The adoption of this hybrid approach for this study was predicated on the questions the research seeks to answer (Barker, Pistrang, & Elliott, 2002) with various mixed options to choose from. The choice of mixed methods was aimed at answering questions which otherwise could not be answered using qualitative or quantitative approach alone (Todd et al, 2004). This provided the flexibility to mix concurrently at one or more stages or across the stages (Leech & Onwuegbuzie, 2009) with the benefit of developing rich insights into various phenomena of interest which otherwise would not be fully grasped using either qualitative or quantitative approach alone (Feilzer, 2010).

Adopting the mixed methods approach to this research provided an antidote to arguments about the advantages and disadvantages of quantitative versus qualitative research and their suitability for certain types of research (Creswell 2009). This was done by bringing the dominant paradigms and world views which traditionally were opposite to each other to collaborate in answering an identified question (Feilzer, 2010). The mixed methods approach used for this study thus drew on the theoretical and technical aspects of both quantitative and qualitative research approaches (Venkatesh, Brown, & Bala, 2012). This also enabled this study to avoid the paradigm wars between qualitative and quantitative research approaches with the advantage of providing the researcher with many design choices which encompass a variety of sequential and concurrent strategies (Walliman, 2001).

With the research focusing on E-government diffusion process in the local government system and seeking to understand key challenges in the diffusion process, the study requires rich and in-depth empirical data. Using qualitative data and analysis provided a level of richness and facilitated the conduct of an in-depth investigation. The study also sought to measure E-readiness of local government for E-government diffusion by proposing an assessment model which required the use of quantitative data and analysis in order to provide an accurate level of E-readiness of these institutions for E-government diffusion (Bryman, 2008).

4.7   Case Study as the Logic of Enquiry or Research Strategy

This research adopts Case Study as the logic of enquiry. A case is a real world human activity which can only be studied and understood in its contextual existence (Yin 1994).

Every research has a logic of enquiry or design, implicit or explicit, which strengthens the validity of the study by ensuring that data is collected properly to address the research problems identified. The logic of enquiry links the research question to data to be collected

and strategies for analysis thereby, ensuring the findings address the research questions. This helps to strengthen the validity and accuracy of a study (Yin, 2011).

The choice of a logic of enquiry depends on the research problem, the research paradigm and the type of research being undertaken (Yin, 1994). Among the logic of enquiries identified are experimental, cross sectional and longitudinal studies, case study and comparative studies (Bryman, 2008). The advantage and disadvantage of each is based on the type of question, the control the researcher has over behavioral events, the focus on contemporary as opposed to historical events (Blaxter, Hughes, & Tight, 2010).

However, under the qualitative approach researchers identified dozens of research strategies with different criteria and explanations. For example, Creswell (2009) identified five qualitative research strategies: biography, phenomenology, grounded theory, ethnography and case study, whereas Robson (2002) pointed to grounded theory, ethnography and case study strategies.

4.7.1 A Case Study Defined

Case study is defined as an empirical study investigating a contemporary phenomenon within its real life situation (Yin, 1994). Case study is ideal within a situation where there is clear evidence of the boundaries between the phenomenon and the context. Case study is credited with strong theory building strategy (Hancock & Algozzine, 2006). Case study concentrates on unearthing the dynamics occurring within particular settings and attempts to learn about a complex situation by extensively describing and analyzing it contextually (Hancock & Algozzine, 2006). It could start with a no priori theoretical notion until data is obtained to understand the background to inform the appropriate theory (Gillham, 2000).

A case study could be descriptive, exploratory or explanatory. It is often concerned with the reasons for occurrences while facilitating investigation into the context of the occurrences and the gap between what was planned and what actually occurred (Darke, Shanks, & Broadbent, 1998).

A case study research can study multiple cases or a single case. A single case study can provide valuable information about the research question from one organization, as it provides rich descriptions of the organizational context. On the other hand, multiple case studies can support the end results by replicating patterns that match (Yin,1994).

A case study is an ideal strategy for detailed studies in situations where there is a lack of knowledge. According to Noor (2008) a case study method is appropriate where a phenomenon is being studied in its natural setting and in situations where the study involves

more than one entity or where more than one method is employed in the data collection process (Noor, 2008).

A case study is also ideal for studies where it is rather difficult to separate the analysis and interpretation from the data collection processes, where the knowledge of a phenomenon is constructed rather than discovered (Yin, 1994). Generalizing findings is predicated on a limited number of cases as well as where generation of theory does not necessarily originate from statistical analysis and deduction but rather from the in-depth understanding of the phenomenon (Noor, 2008).

4.7.2 Rationale behind choosing Case Study as the Logic of Enquiry

In using case study for this research, it was observed that although case study has more often favored qualitative methods like observation and unstructured interviews due to their ability to create an extensive in-depth study of a case, quantitative data and analysis are also frequently utilized (Bryman, 2008) hence, its suitability for a mixed method approach adopted for this study.

The prevalence of case study research in information systems (IS) is growing where its validity is rarely questioned (Pan & Tan, 2011) since it enables the understanding of complex real life activities using multiple sources of evidence (Walsham & Sahay, 2006). Using case study for in-depth analysis of how the government systems could be re-engineered to deliver E-governance is particularly appropriate. Case study thus provided a powerful tool for understanding the problems affecting E-government diffusion in greater details (Walsham, 1995).

Case study also provided the framework to gain a holistic view of the E-government phenomenon in Ghana and provided a clear picture through the utilization of many sources of evidence. It also provided the study the tool to capture the emergent and distinguished properties of life in the organizations studied and the direction of their activities (Benbasat, Goldstein, & Mead, 1987).

Adopting a multi-case approach in the form of many local government areas and institutions facilitated the generalization of the results from findings (Yin,1994). The appropriateness of multiple cases study strategy lies in the ability to follow a replication not a sampling logic (Noor, 2008).

Case study was employed for this study mainly to provide detailed descriptions of a phenomenon, to develop a plausible explanation of the phenomenon and evaluate the phenomenon of E-government in local governance (Kothari, 2004; Walsham 1995). It is

argued that case studies are appropriate for interpretive research in information systems (Walsham, 1995).

Benbasat et al (1987) posited that case study is an appropriate strategy in information systems research such as this because it enables the researcher to understand the nature and complexity of the process taking place; it allows a study of information systems in their natural settings by the researcher and also provides an opportunity for important and essential knowledge in new topics emerging in the rapidly changing information system area (Benbasat, Goldstein, & Mead, 1987).

The foregoing analogy makes the case study the most strategic logic of enquiry or method to greatly help in understanding the E-government phenomena in its natural setting since there are numerous challenges and complex issues facing E-government diffusion and adoption (Choudrie, Umeoji, & Forson, 2012). This study exhaustively examines how technological, organizational, political and stakeholder aspects interrelate in the E-government diffusion phenomena. The study makes the relationships between these issues and their impact on E-government progress more explicit.

An in-depth examination of the nature and context of the environment related to E-government is required. Context-based knowledge is needed to explain the role of the relevant factors shaping the adoption of E-government in Ghana. Using case study for this study allowed for looking beyond the data collected to identify new ideas, understand the concepts and link the patterns and themes in the E-government diffusion. This greatly helped in the E-government diffusion theory building (Gil-Garcıa & Pardo, 2005).

Case study was, therefore, chosen to drive this empirical research aimed at developing an E-readiness assessment model that would be prescriptive and guide the diffusion process of E-government in local governance. In answering the research questions to meet the objective of this study, a case study of the local government level involving local government administration (District Administration) and decentralized departments in the districts to assess their readiness for the diffusion of E-government was adopted.

4.7.3   Unit of Analysis

In conducting a case study research, there is the need to specify the case which can be an entity or an event. The unit of analysis is derived from the case and relates to the primary statement of the research question which is the object of interest. Depending on the research design, there can be more than one unit of analysis (Yin, 1994).

Using the multi-case approach, this study utilized two units of analysis. The first units of analysis are the chief information officers in various ministries and departments at the national level. They were sampled for the validation of the proposed E-readiness measurement model. The second units were the various district administrations, referred to as the Assemblies and the various decentralized departments and agencies which are referred to as MDAs.

4.7.4   Justification for the Cases Selected for this Study

The case selected for this study is predicated on the research paradigm, the research questions and the objectives. The cases for the study were selected with the aid of literature on E-government and local governance in Ghana. Among the criteria for selecting these entities as case were;

i. Valuable data and information: The units for the studies were selected based on their capacity to provide insights into their service delivery in local jurisdiction with respect to the decentralization, E-government implementation and e-strategies, polices, drivers and barriers. The staffs are well educated and were capable to discuss comprehensive state of E-government plans and provided the necessary documentary evidence to support the responses from the interviews and the questionnaire. They allowed access for the inspection of ICT infrastructure and work processes to inform the development of the measurement model (Drüke, 2005).

ii. Involvement of government in service delivery at the local levels was also taken into consideration. These entities are at the forefront of local governance and service delivery, thus successful diffusion of E-government would transform governance at the local as well as national levels. It is therefore, important to evaluate their readiness for E-government diffusion to enable the prescription of remedial measures to ensure successful implementation of E-government (Carrizales & Holzer, 2008).

iii. Easy access to these entities played a role in their selection. In Ghana as in other developing countries, access to organizational information is very limited especially at the national level, and researchers are often not very welcome in state institutions (Darke, Shanks, & Broadbent, 1998). Therefore, given the need to complete the study on schedule, the accessibility to these entities played an important role in the choice of the cases (Gillham, 2000).

iv. Types of organization and services provided: Another consideration was the type of organization and the services they provide. The decentralized departments targeted

offer services which were hitherto delivered by the central government (Abdulai, 2009). These organizations have been decentralized to the district levels and could be transformed in the performance of their functions with effective diffusion of E-government into their operations (Choudrie, Umeoji, & Forson, 2012).

4.8   The Research Methods

Research methods are the techniques or processes, formal or informal, by which research is conducted. The formal methods are systematic processes of doing research which can be replicated by other researchers (Barker, Pistrang, & Elliott, 2002).

4.8.1   Data Collection

Data is a collection of raw facts that need to be organized and processed to produce information. It could be obtained from observation, experience, experiment or a survey and could consist of numbers, images, sounds or words (Creswell, 2006). Data is the primary source of evidence for this research and provided the tools for making rational and robust findings and drawing cogent conclusions (Axinn & Pearce, 2006).

 Data Collection is the process of obtaining data for a research (Driscoll et al, 2007). Data for this mixed-method research were obtained from questionnaires, interviews, observation, documents sampling, field notes and physical artifacts (Creswell, 2009; Benbasat, Goldstein, & Mead, 1987).

Questionnaires were administered both physically and electronically through e-mails and online survey using Google Docs. In-depth face to face interviews using structured and semi-structured questionnaires were undertaken for the collection of both qualitative and quantitative data. The observation of the process of service delivery was passive or semi-active depending on the degree of involvement of the researcher in the activity or object under observation (Kothari, 2004). Document sampling involved the search and review of documents about the object or subject under investigation such as E-government plans and strategies, policy documents and budgets (Yin, 1994).

This study thus employed a concurrent embedded mixed methods strategy for data collection (Creswell,2009). This involves using a single phase for collecting both quantitative and qualitative data simultaneously. Both types of data were collected during the same time frame from same levels of the organization studied with each set of questionnaire answering different research questions (Driscoll et al,2007; Creswell, 2006).

The multi-faceted nature of E-government research requires multiple sources of rich data around specific issues in order to capture the contextual complexity (Benbasat, Goldstein, & Mead, 1987).

Table 4-1: Types of Data and the collection method used

Instrument Used	Type of Data	Source of Data
Survey	Qualitative	Questionnaires
Survey (Physical delivery and Online)	Quantitative	Closed Questionnaires
Interview	Quantitative	Structured Interview
Survey (Questionnaire)	Qualitative	Open ended Questions
In-depth Interview	Qualitative	Clarification Questionnaires
Participant Observation	Qualitative	Workshop
Document sampling/ Content Analysis	Qualitative	Policy Documents, Operational Materials, Reports
Focus Group Discussions	Qualitative	Group Discussion

4.8.2   Survey using Questionnaires

A preliminary study was undertaken by administering questionnaires, both closed and open-ended, to the heads of local government administration and decentralized departments and agencies in the various local government areas. Some of the heads or their representatives were also interviewed face to face at this stage of the data collection.

Online questionnaires were then administered to the Chief Information Officers (CIOs) or officers in similar positions in the central government ministries, departments and agencies most of whom have districts and regional offices in the decentralized system. The responses to these questionnaires were used to validate the conceptual model developed for E-readiness assessment.

Concurrent survey was then undertaken with questionnaire administered both physically and online to the administrative heads of district assemblies and the decentralized departments and agencies randomly. The responses to these sets of questionnaire were used to undertake E-readiness assessment of the responding institutions for E-government diffusion using the validated assessment model.

The questionnaires used in both surveys were preceded by a cover letter briefly explaining the purpose of the research and commitment to privacy and confidentiality for the information provided and permission was sought when interviews had to be recorded.

Table 4-2: Sources of Quantitative Data for Model Validation

Characteristics	Details	Comments
Targeted population	CIOs	Chief Information officers
Targeted sample size	60	Drawn from State and Para-state institutions
Constructs Measured	4	Technology, Organization, Political, Stakeholder
Predictor Variables	21	Based on theories and Literature
Scale	0-5	0= none, 1= very low, 2=low,3= average, 4= high 5= very high
Medium of Survey	Online/ physical	Utilized Google Drive
Sample Method	Purposeful	CIOs attended E-government capacity workshop

4.8.3 Interviews

Preliminary interviews were conducted in selected districts in order to gain insight into local governance in Ghana and the effort being made toward E-governance. The interviews helped in the design of the research and shaped the research questions and objectives. In all, 63 district coordinating directors, the heads of civil servants in local administration, were initially interviewed during the administration of the preliminary questionnaire.

Officials of the national E-government implementation body, NITA were also interviewed after the E-readiness assessment to obtain information about E-government diffusion strategies and also present the findings from the assessment for their comments and to respond to some of the issues raised about the implementation process.

Table 4-3: Source of Quantitative Data for E-readiness Assessment

Level of Gov't	No of Inst.	Departments/ Institutions Surveyed
Regional	10	Regional Admin Education, MMDAs
Metropolitan	12	Metro Admin, MMDAs, Birth and Death
Municipal	18	Municipal Admin. Departments and Agencies
District	23	District Admin, Departments and Agencies,
Total	**63**	

4.8.4 Documents

Document review in research has the advantage of being reliable and could be reviewed repeatedly as a source of information (De Vaus, 2001). This study made use of a number of documents among which are the Ghana Information and Communication Technology for Accelerated Development (ICT4AD) Policy, The National Broadband Policy, Ghana

Government Policy on Decentralization, Ghana Telecommunication Policy, E-Ghana Project and E-Ghana Implementation Report and other reference materials from government related websites. These materials were used to support and compensate for the gaps in the data collected from the surveys and the interviews.

Table 4-4: Proposed Documents for Analysis

No	Policy Document
1	Ghana ICT4AD Policy Document
2	National Telecommunications Policy
3	National Broadband Strategy for Economic Development
4	National Policy on Public Private Partnerships
5	Medium-Term National Development Policy Framework; Ghana Shared Growth And Development Agenda(GSGDA), 2010-2013; Ministry of Communications
6	Medium-Term National Development Policy Framework; Ghana Shared Growth And Development Agenda(GSGDA), 2010-2013; Government of Ghana
7	Decentralization Policy Review
8	Intergovernmental Decentralization Framework
9	Decentralization Policy Framework
10	Budget Statement and Economic Policy of the Government of Ghana for the 2013 Financial Year.

4.8.5 Observations

As part of the data collection process, the author took part in and observed E-government capacity building workshops where the author had the opportunity to meet a number of Chief Information officers as well as chief executives of various ministries, departments and agencies where the E-government implementation process was discussed. The author was also afforded the opportunity of touring a number of districts and decentralized agencies where their operations were studied and recorded. This helped in understanding the local service delivery processes and the administrative structures of the local government system.

4.8.6 The Sampling Process

Sampling is a statistical process where a predetermined number of observations are taken from a whole population. The sampling method employed in a study is dependent on the type of research and analysis being performed and is representative of the general population (Axinn & Pearce, 2006). Among the general types of sampling are;

i. Probability sampling is the sampling method where each of the targets has the same chances or likelihood of being selected for the study (Veach & Guibas. , 1995).

ii. Purposive sampling is a process where the researcher makes an effort to select respondents representative of the population under study based on the position and purpose for the study and therefore, very subjective. This is often referred to as judgmental sampling in which the most useful sample for answering the research question is selected (Marshall, 1996).

iii. No-rule sampling is the process where sampling is done with no specific rules in mind. This is typically done when a whole population is used in a study or where the population is homogenous and therefore, has no selection bias. An example of such sampling is convenient sampling (Smith, Shafi, & Gao, 1997).

This study employed purposeful sampling for the data collection. Representatives from the districts, departments and agencies were selected where necessary information could be obtained pertaining to the subject under study. The participating local authorities and the departments were intentionally selected due to their experience in local governance and local public services delivery (Creswell et al, 2006). Using purposeful sampling also enabled the identification and selection of participants, the CIOs, who are knowledgeable in ICT deployment in their organizations for the validation of the conceptual model developed for E-readiness assessment.

For the preliminary studies, convenience sampling was used to identify local government areas with easy accessibility to both institutions and officials. These local government areas were representative in terms of the types of local government administration in Ghana (Axinn & Pearce, 2006). Using purposeful sampling again facilitated the identification of implementing institutions and the officials for E-government diffusion in the country for the conduct of the interviews and access to relevant documents.
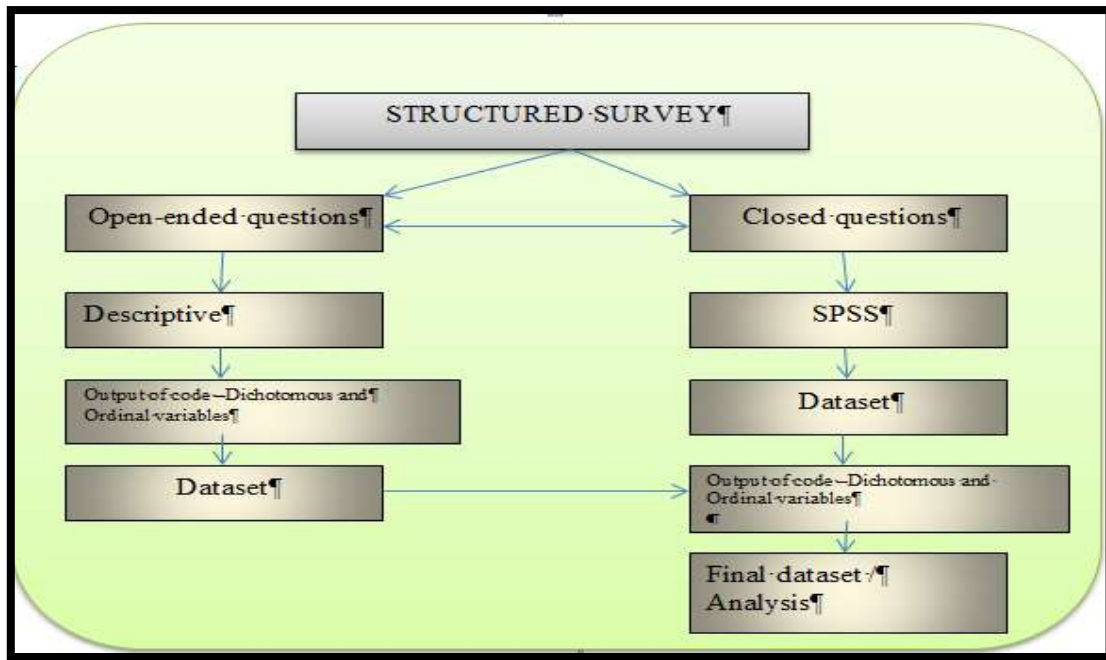
Figure 4-3: The Design for Data Collection

4.9   Ethical Considerations

Ethics in research involves the need to do what is good and avoid harm to participants of the research. There are ethical issues to be dealt with in any type of research specifically regarding the administration of questionnaires and the conduct of interviews. Among these is the tension between the aims of the research that generate knowledge for the good of others and the right to privacy of the participants of the study (Merriam, 1998). Protecting the human subjects and participants for this study was of great importance.

 The ethical issues in mixed-method studies such as this are delicate compared to purely qualitative research (Sapsford & Jupp, 2006). The potential conflicts in gaining access to the districts and departments surveyed and the impact on the participants were critically examined. The examination of documents and policies, especially documents labeled official and restricted, were of concern since officials need assurances of confidentiality and privacy

This study made extensive use of interviews, observation, questionnaires and documents .The success of this study thus depended on the participants' willingness to share their experiences, hence the need for assurances of anonymity which facilitated the willingness of the participants to respond to the questions asked in both the questionnaire and the interviews.

Access to participants was thus negotiated with anonymity and privacy guarantees, thereby creating quality social interaction that facilitated access to information.

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Effort was made to avoid potential conflict of interest as domain expert during the study since officers interviewed had the tendencies of asking for solution and help in dealing with the phenomenon (Orb, Eisenhauer, & Wynaden, 2000). In addition, the data collection procedure was implemented with no variations to a particular district or department to avoid biases and ensure uniformity in the standard of assessment.

4.10 Data Analysis using Triangulation Approach

The triangulation approach is considered probably the oldest and most recognizable data analysis strategy used in mixed methods research (Creswell et al, 2006). Triangulation approach was used in this study because of the need for utilizing complementary types of data to be able to draw valid conclusion. Both qualitative and quantitative data were compared and used to complement the results obtained from each other (Leech & Onwuegbuzie, 2007). Qualitative and quantitative data were collected and analyzed simultaneously or sequentially.

After independently analyzing the two sets of data, they were then merged by comparing and sanitizing the separate results of the two data types. The quantitative and qualitative components of triangulation studies are emphasized equally in the study's conclusions (Plano-Clark et al, 2008).
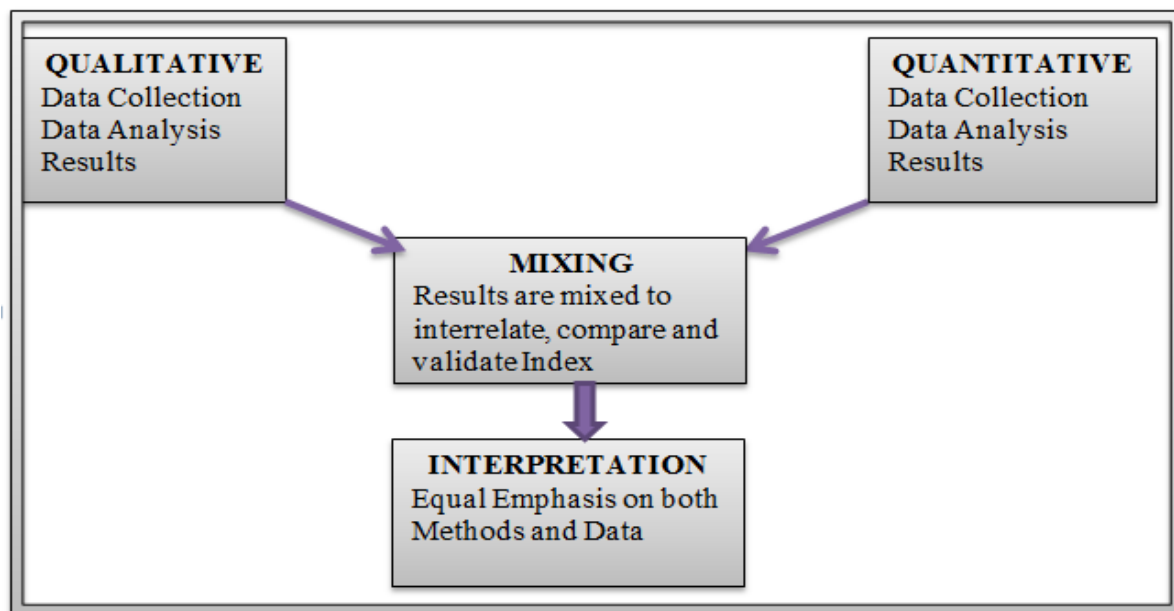
Figure 4-4: Triangulation of the Data Analysis

The use of the triangulation approach to the study ensured that thematic and comparative analyses were used simultaneously for both qualitative and quantitative data. The thematic analysis was used to identify the emerging themes from the data and a comparison made

between different departments and agencies in different local government areas. A narrative approach provided the tool for the presentation of details of the data and developing practical knowledge and meaning from the responses of the participants (Kimchi, Polivka, & Stevenson, 1991).

4.11 Validity and Reliability

A great deal of attention was given to reliability, validity and generalizability of the methods applied in this study. Without such attention to reliability, validity and generalizability of the methods used, the study would be worthless, loses its value and becomes a fiction (Kirk & Miller, 1988). Reliability and validity have been associated with quantitative research and are rooted in the positivistic paradigm (Morse et al, 2008). However, the need to ensure rigor is driving the attention of reliability and validity in qualitative research (Morse et al 2002). Although reliability and validity are subtle as criteria and standard for the evaluation of the significance, relevance, impact, and usefulness of completed research (Golafshani, 2003), they are still very relevant to all research since the centre of all research is to find convincing and credible conclusion or interpretation (Whittemore, Chase, & Mandle, 2001).

Prolonged data collection on site, clarification and engagement of peer consultations coupled with the use of expert opinion ensured reliability and validity of this study (Krefting, 1991).

The triangulation approach was used in the data analysis in this study to test the reliability and validity of both set of data collected from which valid and reliable conclusions were drawn.

Validity is the concept of demonstrating that the proposition generated, tested and or refined is matches of the causal conditions as obtain in the real world. There are both internal and external validities (Salkind & Rainwater, 2000).

Internal validity answers the question of whether the researcher actually observed and measured what is thought as being observed or measured which is critical to any research approach and design (Golafshani, 2003). External validity is the extent to which the theoretical constructs and postulates generated, refined, or tested by the researcher are generally applicable (LeCompte & Goetz, 1982). Validity therefore, provides the assurance that whatever is to be measured is what was really measured to achieve the objectives and satisfy the purpose of the study as well as guaranteeing that the study is free from any bias in terms of inferences and conclusions (Creswell & Miller, 2000).

The validity of the findings of this research was ensured through the empirical application of the E-readiness assessment model developed for this study and the use of expert opinion in the validation of the conceptual E-readiness assessment model developed (Golafshani, 2003).

Reliability is the extent to which consistent results are free from measurement errors which could be generated by a tool (LeCompte & Goetz, 1982). Research reliability measures the consistency of research results over time, the accuracy in representing the population under study and whether the results obtained can be reproduced by using similar methodology (Merriam, 1995). While reliability is a necessary step to have a valid measure, it does not guarantee its validity (Kimberlin & Winterstein, 2008).

Among the tools used in ensuring reliability of this study was to undertake a pilot or preliminary study in the early stages of the research, the use of multiple sources of evidence, triangulation of analysis and consultation of expert opinion (Creswell & Miller 2000) (LeCompte & Goetz, 1982).

4.12 Generalizability and Transferability

Generalization of research findings from a sample of a population continues to generate intense debate among researchers (Robson 2002) more so when the research uses a case study (Eisenhardt, 1989). Quantitative research is designed and constructed so as to enable generalization of results, but generalization or external validity is often disputed since the sampled population is often not large enough (Miles & Huberman, 1994) making results not generalizable beyond the situated study.

Transferability has therefore been advocated as a parallel concept in qualitative research (Robson, 2002). It is argued that transferability is as applicable for qualitative research as generalizability is for quantitative research, thus adopting transferability means the results obtained from a study could be transferred to an environment or a situation with similar parameters (Guba & Lincoln, 2011).

This use of a mixed methods design, triangulation of data collection and analysis and multiple case studies ensured generalizability as well as transferability of the results and findings of this study (Driscoll et al, 2007).

4.13 The Structure of the Thesis

The structure of this thesis provides the linkages of the contents of the various chapters that contributed to the solution of the research questions. The first chapter provides the introduction to the study leading to the statement of the research questions and the objectives.

These provided the direction of the literature to review such as decentralization and public sector reforms as well as E-governance.

The empirical literature that informed the choice of the theoretical framework to use in the study is presented in the second chapter. The theories considered appropriate for a study of this nature were studied and presented in chapter three. The four theories reviewed namely the diffusion of Innovation Theory (Rogers, 2003), Technological, Organizational and Environmental Framework (TOE) (Tornatzky & Fleischer, 1990) were used to understand and identify influential factors involved in the diffusion of technological innovations such as E-government. Since the diffusion and obtaining the benefits of any technological innovation requires institutional involvement and the processes of institutionalization, the institutional theory was employed to identify institutional factors affecting E-government diffusion and institutionalization.

Stakeholders play important role in the diffusion of any technological innovation, hence the ability to identify the stakeholders of and institutions diffusing E-government, their salience and likely factors that would affect adoption of such innovation is essential.

These theories were thus used to identify the factors that were used as the main constructs and their predictor variables in the E-readiness assessment model developed for the study as well as providing theoretical foundation for the variables used in the model in the E-readiness assessment. The theories therefore, supported the various predictor variables and the questions asked to determine the state of a predictor variable.

The conceptual E-readiness assessment model developed was then validated with quantitative data and analysis and was subsequently used to assess the E-readiness of local government institutions, departments and agencies in Ghana to ascertain the transferability and replicability of the model so developed. The analysis and findings of the study are therefore rooted in validated theories.

4.14 A Reflection on the Research Methology Used

It is always challenging conducting research in the area of public administration in developing countries such as Ghana where access to public officials and the necessary information remains a daunting task especially for the purpose of data collection. Many public officials in Ghana especially are very skeptical about research and information and communication technology. After the exploratory study, it was identified that the biggest challenge to undertake the study would be access to data and the targeted officials.

To gain access to officials and obtain the data required to first validate a model and the data to be used to assess the E-readiness of the local government institutions to diffuse e-government, there was the need to adopt a pragmatic approach to solving the research problem. Relying on quantitative approach alone could present challenges especially in understanding the human and institutional issues involved in the E-government diffusion. On the other hand, relying on qualitative approach alone would have made it nearly impossible to statistically test the proposed measurement model. The use of mixed methods provided the opportunity to obtain the necessary data for the study using methods like participant observation and document sampling that facilitated the understanding of policy directions of both E-government and decentralization, while the use of concurrent survey ensured that the qualitative data and quantitative data were obtained around the same time. This ensured that findings from the analysis of both data could be compared and their sharp disparities investigated.

The strength of the use of mixed methods in a situated research as the case of this study is therefore, highly appreciated. The qualities of both qualitative and quantitative research are thus appreciated better and are utilized in this study to ensure validity of the findings.

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CHAPTER 5

5   DECENTRALIZATION AND E-GOVERNMENT DIFFUSION IN GHANA

5.1   Introduction

This chapter describes the case of interest of this research which was also used for the validation of the proposed E-readiness assessment model. Ghana, like many other developing countries is faced with the choice of integrating the growing capabilities of ICT in its public administration and governance. The chapter discusses the decentralization systems in Ghana under the District Assembly concept and the problems associated with its implementation. It also describes Ghana's quest for ICT diffusion in the public sector. The chapter highlights the policies, regulatory as well as legislative frameworks for E-government diffusion. The progress of E-government made under the E-Ghana Project is also discussed.

5.2   Situating the study in Ghana

In the last two decades, developing countries, especially in sub-Saharan Africa, have been encouraged by their development partners and the increasing accessibility to ICT to diffuse E-governance (Gebba & Zakaria, 2012). Post-independent Ghana is often hailed as the beacon of peace, democracy and stability in a strife-torn region of West Africa (Fosu, 2013). The country has for many years pursued several public administration and governance reforms as part of wider efforts for enhancing good governance (Boachie-Danquah, 2011). These reforms are being pursued to ensure adherence to the rule of law and respect of human rights (Weiss, 2000), facilitating and deepening democracy and promoting transparency (Woods, 1999), as well as ensuring efficiency and equity in public administration (Santiso, 2001).

Prominent among these reforms are various forms of decentralization. These reforms sought to devolve governmental authority and administrative functions to local governments (Antwi-Boasiako, 2010). This is accompanied by financial management and revenue mobilization functions with the purpose of ensuring good governance through increased efficiency, effectiveness and responsiveness in public services delivery (Boachie-Danquah, 2011; Dick-Sagoe, 2012).

Given the transformation potential of information and communication technology (ICT) for public sector management and service delivery, E-government promises transparent, effective and efficient public sector management and service delivery for developing countries

(Watson, 1997; Heeks, 2002). Ghana has therefore embarked on E-government diffusion over the last decade in its public administration to take advantage of the benefits that information and communication technology could offer in public administration.

5.2.1 A Summary of the profile of Ghana

Ghana has over the years been a trail-blazer and an example of the potential success story in the area of politics, democracy and developments in the continent often noted for depressing news (McCauley, 2013; Heldring & Robinson, 2012). Located in the west of Africa, the Republic of Ghana covers a land area of 238,533 sq. km. Ghana's population stands at 25.7 million with a GDP of 40.71 billion US Dollars and an annual economic growth averaging about 8 per cent over the last decade. With per capita a GDP of 1,550, Ghana is considered a lower middle income country (WB, 2012).

Ghana boasts of a higher literacy rate of 71.5% of the total population compared with many of the countries in the same sub-region. Literacy among males is 78.3 and that of females stands at 65.3% (GSS, 2010)

Over the last decade, there have been phenomenal increases in access and utilization of ICT driven by the mobile revolution. Increasing competition among the Mobile Network Operators (MNO) has resulted in price and promotional wars, thus driving the cost of access and use of mobile services down. The arrival of three more undersea fibre optic cables to Ghana has further boosted the speed and availability of bandwidth with significant price reduction resulting from the competition (NCA, 2013).

Ghana thus, boasts of over 100 per cent mobile voice subscription with 27,591,772 mobile subscriptions as at October, 2013 whilst mobile data subscriptions stood at 10,187,768 (NCA, 2013). Ghana was ranked 15th in Africa in terms of Internet penetration which stood at 14 per cent (ITU, 2012). This figure could even be higher given the number of mobile phone users who access the Internet on their phone. Ghana was the first country in sub-Saharan Africa to pioneer the utilization of Internet in offices and homes in 1993, but now falls behind countries like the Seychelles, Mauritius, South-Africa, Cape Verde, Botswana, Namibia, Gabon, Kenya, Zimbabwe, and Swaziland in terms of Internet penetration (GISPA, 2013).

Like many developing countries in the last two decades, Ghana adopted its ICT Policy for Accelerated Development (ICT4AD) in 2003 aimed at using ICT as a catalyst for the economic transformation of the country (Dzidonu, 2003).

Given the above profile, situating the study in Ghana provided the opportunity for testing a proposed model to access E-readiness in a developing country with a stable political

environment and an emerging economy. This would make the validated model applicable in a large number of countries with similar characteristics and could be adapted to suit other developing countries who also aspire to diffuse E-government.

Secondly, Ghana was used as a case study to test the application of the validated model to highlight the state of E-readiness of the decentralised agencies and departments across the country for the diffusion of E-government. This would highlight the factors influencing the diffusion of e-government to inform the development of strategies and policies to utilize e-government as a tool for facilitating decentralization in the country. The findings would also be useful for other developing and lower middle income countries with similar characteristics in the development and diffusion of E-government.

Figure 5-1: Map of Ghana with Major Cities: Source; www.mapsofworld.com

5.2.2 Decentralization and Local Government Reforms in Ghana

Ghana has a unitary political system and a thriving multi-party democracy. Ghana's decentralisation process aims at moving governance from the command and control system to a more consultative and participatory one (Mohan, 1996; Ayee, 1997). This would be achieved with the transfer of power, authority, functions, expertise and resources to the district level as has been enshrined in the 1992 constitution (Crawford, 2004). This involves a

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comprehensive implementation of decentralization (Antwi-Boasiako, 2010; Crawford, 2004) and in recent years, market privatisation in the form of public-private partnerships is becoming an integral part of the decentralization strategy (Ahwoi, 2011).

Ghana's decentralization involves all the three key strands of decentralization. Administrative decentralisation involves the extension of the civil service jurisdiction to the local governments (Nkrumah, 2000). Fiscal decentralization gives local governments the right to raise their own revenue and provides them with unconditional transfers from the central government while political decentralization would promote greater citizens participation in decision making and improved interaction between locally elected officials (Hoffman & Metzroth, 2010).

Although the local government units are allowed a certain degree of independence in the development and delivery of local services, the central government exercises supervision and control (Antwi-Boasiako, 2010; Crook, 2003).

5.3 The Structure of Decentralization and Local Government System in Ghana

The District Assembly concept is a democratic decentralized local government structure (Ahwoi, 2011) aimed at promoting local democracy and development while improving local administration and services delivery (Antwi-Boasiako, 2010). It involves the transferring of functions, powers, responsibilities and resources from the centre to the district, municipal and metropolitan assemblies (Crawford, 2004). These three types of assemblies are the highest units of local government, each with sub structures namely sub-metropolitan, area councils and unit committees performing functions as delegated by the Assemblies (Amadu, 2004; Dick-Sagoe, 2012).

5.3.1 Ministerial oversight

The Minister for Local Government and Rural Development is responsible for monitoring the effectiveness of local government and the decentralisation process and advises the central government on local government issues (Egbenya, 2010). The Minister acts in an advisory capacity to district assemblies in approving their by-laws (Ahwoi, 2011). On the advice of the minister the president can suspend an assembly (Antwi-Boasiako, 2010).
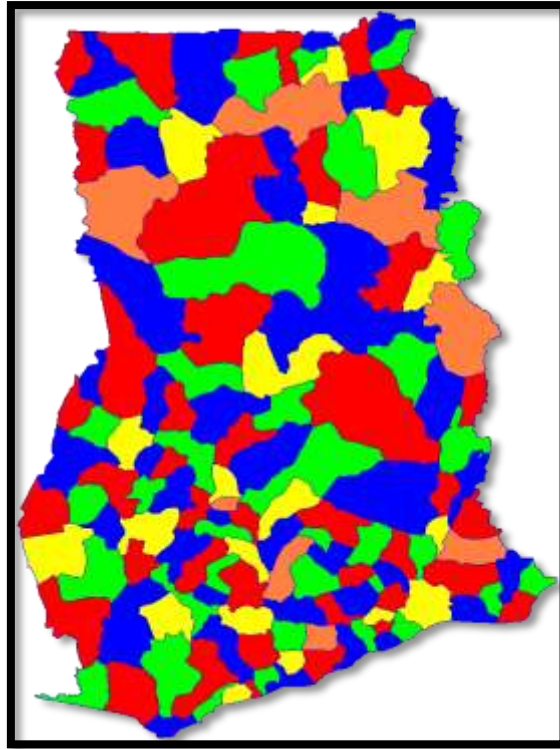
Figure 5-2: Decentralized Local Authorities in Ghana

5.3.2 Regional Level Decentralization: De-concentration

Regional Coordinating Councils (RCC), headed by the regional ministers constitutes the regional level governments. They comprise the heads of government institutions, ministries, departments and agencies (MDAs) in the 10 administrative regions (Decentralisation Policy Review, Final Report, 2007; Ofei-Aboagye, 2001).

These MDAs act as de-concentrated departments of the national level. MDAs are tasked with the implementation of policies and decisions from the parent MDAs and provide them with feedback from the sub-national level (Boachie-Danquah, 2011). The regional coordinating councils thus, ensure effective direction, monitoring and harmonisation of their operations and report to the sector minister (Ahwoi, 2011).
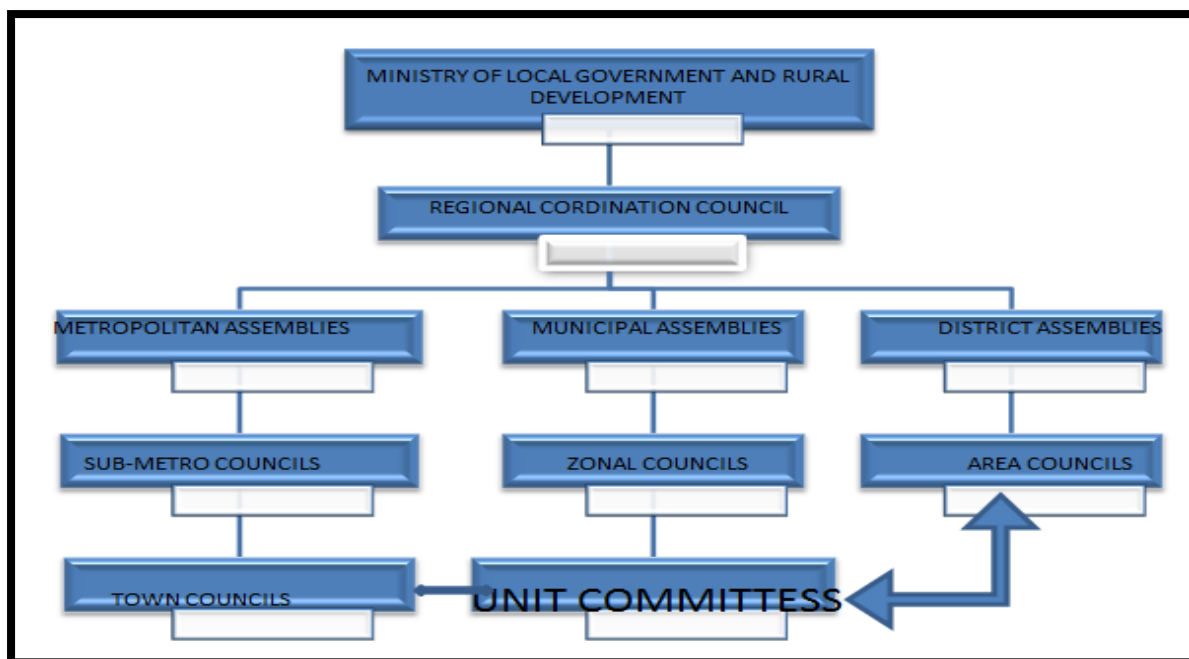
Figure 5-3: Levels of Government in Ghana

5.3.3   The District, Municipal and Metropolitan Assemblies; Devolution

The Metropolitan, Municipal, and District assemblies constitute the core units of local governance under the local government system in Ghana (Acheampong, 2010). There are 6 metropolitan, 40 municipal and 124 district assemblies in Ghana (http://www.ghana.gov.gh).

Metropolitan assemblies are urban-based with minimum populations of 250,000, Municipal assemblies are quasi-urban, single city councils with populations not below 95,000 (Acheampong, 2010). The district assemblies however combine rural areas and small towns covering large geographical areas (Dick-Sagoe, 2012).

The metropolitan structure is four-tiered while the municipal and district assemblies have a three-tiered system (Ofei-Aboagye, 2001; Ahwoi, 2011). The District or Municipal Chief Executive (D/MCE) is appointed by the president with executive and administrative functions and is the representative of the president in the District (Boachie-Danquah, 2011; Ahwoi, 2011).

The Assemblies are made up of seventy per cent elected members and thirty per cent appointees by the president based on their experience and specialised expertise, with members of parliament representing constituencies in each district as ex-officio members (Abdulai, 2009; Antwi-Boasiako, 2010).

In the true meaning of devolution, the system empowers the District Assemblies with legislative, administrative, development planning, budgeting, rating and service delivery

authorities with a clear definition of functions, responsibilities and the right to own, control and manage key spending decisions in the local public sector (Antwi-Boasiako, 2010).

The districts are required to mobilise adequate financial resources and are largely independent in allocating and utilizing these resources (Boachie-Danquah, 2011). They are responsible for their budgeting with structures and mechanisms to promote and ensure probity, democracy and responsiveness (Government of Ghana, 2008; Acheampong, 2010). Good governance is therefore, the focus of the local government system (Amadu, 2004).

5.3.4   Town, Area, Zonal and Unit Committees: (Delegation)

The last tier of the local government systems are the town, area, zonal councils with five representatives of the district assembly, ten of unit committee members elected from the area and five persons appointed by the government (Acheampong, 2010).The sub-district structures have no legislative or executive authority but the district assembly delegates some responsibilities to them for specific functions. The unit committees, the lowest level of the structure, have both elected and appointed members. There are around 16,000 unit committees countrywide (Ahwoi, 2011; http://www.ghana.gov.gh).

5.4   Municipal Services Delivery

The central government retains control over policy for service delivery while the implementation of the policies and the provision of facilities are shared between central government and the assemblies (Boachie-Danquah, 2011).

For instance, while the assemblies are responsible for the provisioning of basic education, central government retains control over educational policy. Basic education, primary health care, and public health are among the responsibilities of DAs within the sector of municipal services delivery. Social welfare and planning are a shared responsibility between the districts and the central government and (Decentralisation Policy Review, Final Report, 2007; http://www.clgf.org.uk/userfiles/1/File/2008_Country_Files/GHANA.pdf).

Figure 5-4 below presents the values drivers of decentralization in Ghana.
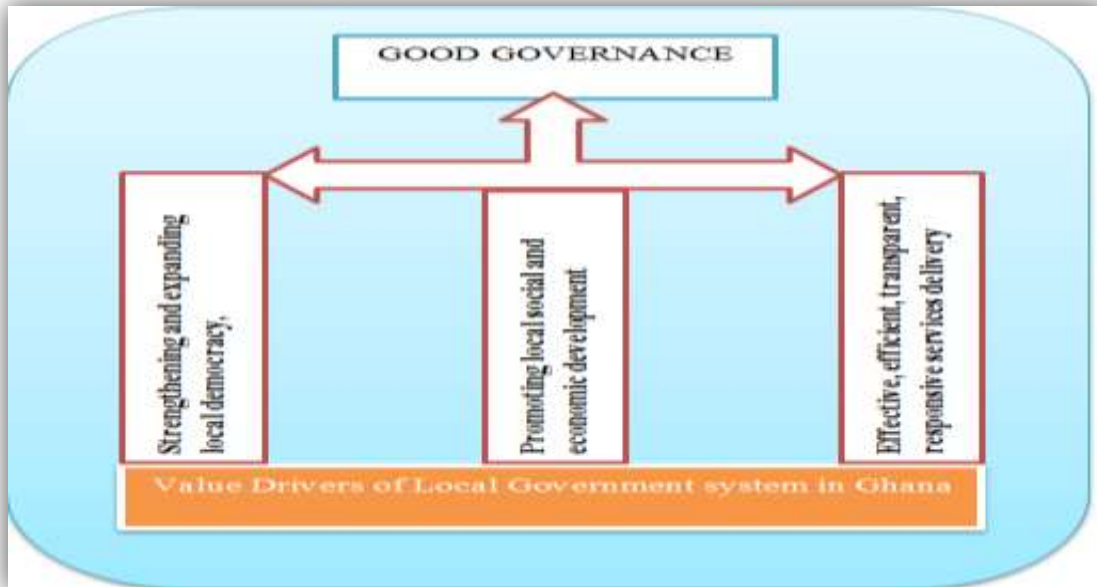
Figure 5-4 Value drivers for Local Government System in Ghana

5.5   Legal and Institutional Framework

Initiated in 1988 under the military government of the Provisional National Defence Council (PNDC) with the promulgation of PNDC Law 207, Ghana adopted the District Assembly Concept to replace the District Councils which had been in existence since the early 1970s (Nkrumah, 1990; Haynes, 1991).The current fourth republican constitution of 1992, chapter 240, provides for decentralization and local governance with guidelines on the institutional arrangements, the key actors of the decentralized administration, their roles and responsibilities and resources allocations (http://www.judicial.gov.gh/constitution; Antwi-Boasiako, 2010).

Article 35 (6) (d) of the Constitution requires the state to promote democracy by decentralizing the administrative and financial structure of government to the regions and districts (Crawford, 2004). Article 35(5d) requires the state to take appropriate measures to ensure decentralisation in administrative and financial administration of government and to provide opportunities for people to participate effectively in governance and decision making at every level to ensure accountability and responsiveness (Decentralisation Policy Review, Final Report, 2007; http://www.judicial.gov.gh/constitution).

Under the same constitution, a District Assemblies' Common Fund (DACF) has been created to provide between 5% and 7.5 % of the national revenue be distributed to district assemblies (Crawford, 2004; Ahwoi, 2011). The local government system therefore, operates in the

context of relevant provisions in the 1992 fourth republican constitution and ancillary relevant legislation for decentralization and local governance among which are:

  i.   Local Government Act, 1993 Act 462

  ii.   National Development Planning (System) Act, 1994, Act 480

  iii.   Civil Service Law, 1993, PNDCL 327

  iv.   District Assemblies' Common Fund Act, 1993, Act 455

  v.   Local Government Service Act, 2003, Act 656 and other legislative instruments establishing the individual assemblies.

  vi.   Institute of Local Government Studies Act, 2003, Act 647

5.6   Problems Hindering Effective Local Governance

  i.   Administrative decentralization: With most districts being rural, attracting qualified civil servants to stay in these districts for effective management has become a problem. There is also lack of effective structures and avenues for engaging citizens' participation in decision-making and development planning except during elections and sometimes through the assembly members (Ofei-Aboagye, 2001; Crawford, 2004).

  ii.   The sub-district structures lack the human and material resources to perform their functions effectively resulting in widespread apathy towards the operations of the sub-district structures because most people who are working on them are not paid; being a member of these structures is entirely sacrificial and voluntary (Ofei-Aboagye, 2001; Amadu, 2004).

  iii.   Fiscal decentralization: Due to the rural nature of most of the districts, there are insufficient taxable economic activities except in a few metropolitan and municipal assemblies leaving many of the rural districts with no reliable options for revenue generation. Hence, without large transfers from the central government, the districts are incapable of delivering the required services (Acheampong, 2010; Ahwoi, 2011).

  iv.   Political Decentralization; There are complexities and vagueness about the role of the regions in the national governance structure. The decentralized departments also are yet to be integrated into the assembly administration and in implementing fiscal decentralization (Boachie-Danquah, 2011; Hoffman & Metzroth, 2010).

  v.   For reasons of national unity and security, local government is non-partisan and the head is appointed, thereby maintaining the central government authority and control over the assemblies, and also the issue of integrating traditional rulers into the formal

local government structures remains a challenge (Hoffman & Metzroth, 2010; Ahwoi, 2011)

The persistence of the above problems after two decades of implementing the current local government system calls for further reforms and interventions if the proposed objectives are to be fully achieved. Among the several options is the diffusion of E-government in the local government system (Caldow, 2004; Heeks, 2002).

It is an undeniable fact that decentralization and local governance remain a viable approach to fostering sustainable and responsive development, but the process needs a catalyst, thus there is an urgent need to consider harmonizing proposals for re-organization in this digital age to maximise the capabilities of E-government as a tool for decentralization (Drüke, 2005).

5.7   Emergence of E-government in Ghana

The belief that strategic implementation of E-government could improve efficiency, accountability and transparency of government as well as deepening democratic participation has provided impetus to the diffusion of E-government in many developing countries with the support of donors and international institutions such as the World Bank and NEPAD (http://go.worldbank.org/VKHGDY6PY0). This is because developing countries still lag behind in harnessing the potential of E-government and other ICT applications in government and governance processes (Abdallah & Fan, 2012).

Although there have been some level of deployment of ICT in the government process, it has largely reinforced rather than transformed the existing processes with very little interconnection between different government departments and agencies (Macintosh, 2003; Lind, 2012). This is evidenced in citizens providing the same set of data to each department in accessing public services with no means of the departments validating the information so provided (Rajapakse, Van Der Vyver, & Hommes, 2012)

For E-government to deliver the envisaged value to government as well as citizens, it should be transformative and ensure interoperability throughout the government system (Nam, 2011). E-government is not merely the deployment of information systems in a government department, it requires reengineering of public administration practices and service delivery processes (Grindle, 2007).

Developing countries are being encouraged to be part of this change to ensure transformation of government from the colonially inherited rigid Weberian bureaucracy (Watson, 1997) to an efficient, dynamic and agile systems which facilitates efficiency, effectiveness and

democracy where policy making is broadened, and citizen participation and feedback to government are ensured (Ahn & Bretschneider, 2011).

The government of Ghana has responded with an E-government initiative aimed at promoting electronic governance to ensure efficiency, effectiveness and quality decision making in the delivery of public services (Dzidonu, 2003). The identification, mapping and analysis of the initiative in the context of the decentralization process would strengthen E-governance since the local government institutions, departments and agencies are at the forefront of local service delivery (Caldow, 2004; Kanungo & Jain, 2012).

5.7.1 E-government Diffusion in Ghana (The E-Ghana Project)

Although E-government constitutes a significant component of public sector innovation and provides effective mechanisms for enhancing participation of various governance actors (Ho, 2002), the diffusion and adoption processes continue to face enormous challenges especially in developing countries such as Ghana (Andoh–Baidoo, Babb, & Agyepong, 2012; Heeks & Santos, 2009). With the rapid improvements in Internet connectivity and web technologies, governments are shifting the focus of ICT application from back-end processes to external relationship with governance actors (Welch, Hinnant, & Moon, 2005). The identified challenges range from political, technological, organizational and social (Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

Managers of public sector organizations are often dissatisfied with the return on their investments in information and communication technologies with increasing costs and rapid changes in technologies (Wagenaar & Janssen, 2004; Lind, 2012). This requires the collaboration of all arms of governments and the establishment of shared-service to avoid duplications which is feasible under E-government (Wagenaar, Marijn, & Janssen, 2004; Kumar & Rawat, 2012).

The emergence of E-government in Ghana is rooted in the Ghana Information and Communications Technology for Accelerated Development Policy (ICT4AD). This policy was launched to guide the government's efforts to transform Ghana into a knowledge-based society through the development, deployment and utilization of information and communication technologies in all sectors of the economy and the society, thus making Information and communication technology a key driver for economic growth (ICT4AD), 2003).
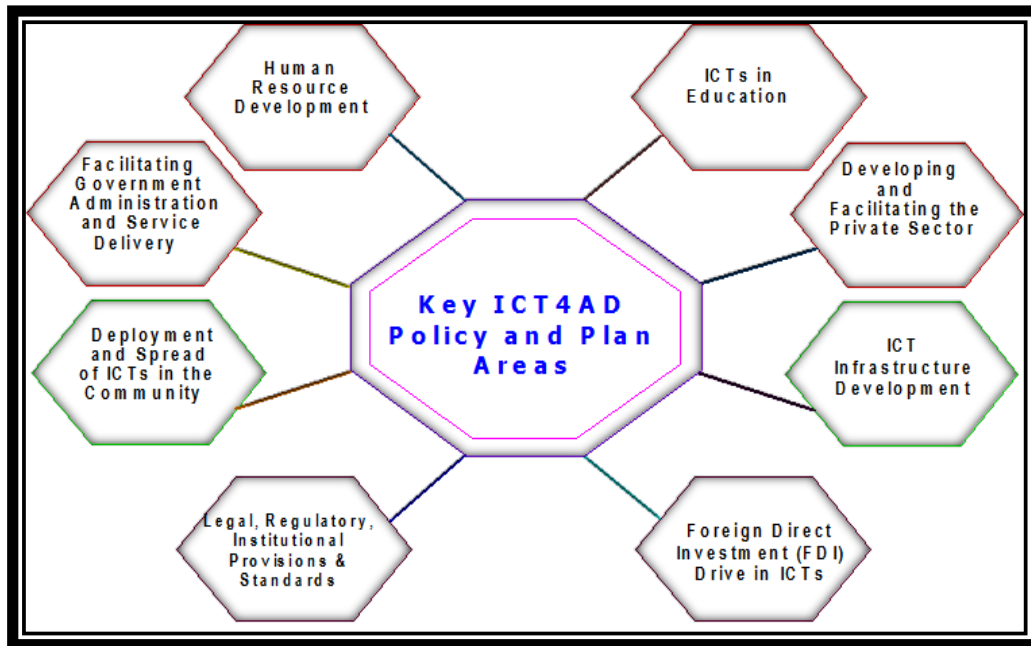
Figure 5-5: Key ICT4AD Policy and Plan areas

(The Ghana ICT Policy for Acelerated Development,(ICT4AD), 2003)

One of the fourteen key pillars of Ghana's ICT policy is the exploitation of information and communication technologies to drive the management and service provisioning by the government making E-government central to the efforts to modernize the Ghanaian economy in particular and the society in general (Boateng, 2009; Dzidonu, 2003).

It is anticipated that the convergence of government and technology can potentially transform public administration and the citizen's experience of it (ICT4AD, 2003; Somuah, 2009).The E-Ghana project is therefore, aimed at:

i.   Improving delivery of government services through the use of information and communication technologies,

ii.   Leveraging information and communication technologies to stimulate economic growth and poverty reduction,

iii.   Improving ICT-mediated service delivery in Ministries, Departments and Agencies through PPP,

iv.   Development of ICT/ITES industry,

v.   Developing and promoting an enabling environment for ICT investments (Yarney, 2005; http://www.nita.gov.gh).

5.8   The Strategic Approaches to E-government Diffusion in Ghana

Tasked to spearhead E-government implementation in Ghana, NITA has adopted six strategic approaches (Yarney, 2005; http://www.nita.gov.gh). These are;

i. The establishment of the Institutional Framework to provide oversight and coordination of the diffusion process;

ii. The establishment of a component-based Ghana Government Enterprise Architecture (GGEA) to facilitate the diffusion of E-government;

iii. The deployment and implementation of a secure, robust, and interoperable E-government infrastructure;

iv. Putting in place the Legal and Regulatory Frameworks that support the diffusion and the adoption of E-government in all aspects of the government machinery;

v. Leverage extensive utilization of information and communication technologies throughout the government structures to ensure a functioning E-government Environment such as deployment of e-services to facilitate the meeting of key socio-economic developmental objectives;

vi. Seek and encourage active public-private partnership framework in the implementation of E-government (Boateng, 2009).

5.8.1 Institutional and Legal Framework for E-government Diffusion

The key Ministry responsible for the overall diffusion of E-government in Ghana, dubbed the E-Ghana project is the Ministry of Communications (Boateng, 2009). The implementing agency for the project under the Ministry is National Information Technology Agency (NITA). Established in 2006 as Ghana Information Technology Directorate (GICTeD) (Yarney, 2005), it was given an agency status and the name was changed to National Information Technology Agency (NITA) by an act of parliament in 2008 to provide the needed impetus for the implementation of the E-Ghana project (Ghana National Information Technology Agency Act 771, 2008; Boateng, 2009).

The National Information Technology Agency (NITA) is tasked to provide leadership in the diffusion and the adoption of information and communications technologies (ICTs) in the public sector towards transforming public administration, information dissemination and service delivery (http://www.nita.gov.gh/pages.aspx?id=2).

The Agency (NITA) is envisioned to:

i. become an information and communication technology management entity equipped with the competencies to drive the national transformation through the promotion of ICT-based services in the public sector specifically and the country as a whole;

ii. provide leadership and drive to public sector transformation through E-government for efficient and effective governance;

iii. provide the foundation and framework for utilizing information technology to transform Ghana into a knowledge-based society;

iv. provide enabling conditions and build the capacity of people to deliver the transformation required to achieve the Agency's vision and

v. Encourage all Ghanaians to participate in and exploit the opportunities made available through information and communication technology (ICT) (Boateng, 2009) (http://www.nita.gov.gh/pages.aspx?id=2; Ghana National Information Technology Agency Act 771, 2008).

The legal framework supporting the Agency, the Electronic Transactions Act, 2008 (Act 772) additionally tasks the Agency to perform certification functions. The responsibilities assigned the Agency under the Act are;

i. The implementation and monitoring of the national information communications technology policy;

ii. Issuance of requisite licenses under the Electronic Transactions Act, 2008 (Act 772) and to ensure fair competition among technology service providers. It must also ensure that these service providers comply with conditions governing the licenses issued to them;

iii. Provide access to the database for licenses, applications for licenses as well as equipment approved where possible. The Agency also serves as registrar and registry for approvals given for equipment under the Electronic Transactions Act, 2008 (Act 772);

iv. Investigate and resolve disputes between license holders under the Electronic Transaction Act referred to it as well as disputes between users and license holders.

v. Develop the quality of service indicators and reporting requirements that apply to license holders under the Electronic Transaction Act (http://www.nita.gov.gh; Electronic Transactions Act, 2008 Act 772, 2008).

5.8.2   The Progress Made by NITA in E-government Diffusion

The E-Ghana project has three main components. These are; creating enabling environment, supporting local ICT-based businesses and IT-enabled services (ITES) in Ghana and E-government applications and government communications (http://www.nita.gov.gh/eGhana-Project).

To create the enabling environment for the diffusion of E-government, the National Information Technology Agency (NITA) has developed the Ghana Government Enterprise Architecture (GGEA) and the Ghana E-government Interoperability Framework to guide the development and deployment of E-government applications in various ministries, departments and agencies (MDAs) under government while the private sector is being encouraged to use these frameworks to facilitate transactions with government or the MDAs (Bediako, 2012).

To support ICT-Based businesses and IT-Enabled service, a World Bank support of 40 million US Dollars was approved in 2006 for the development of an IT-Enabled Services industry to facilitate the improvements and transparency of certain government functions through E-government. In this area, the computerization of the Registrar General's Department (RGD), the Ghana Revenue Authority (GRA), and the deployment of an e-service portal are worth mentioning (Bediako, 2012).

There have also been Public Private Partnership (PPP) projects such as the GCnet for the computerization of ports and harbours processes, the School Selection and Placement System which places prospective students in the various second cycle institutions as well as an electronic payment infrastructure which is being put in place (Boateng, 2009).

To improve information and communication infrastructure, the government Wide Area Network to provide connectivity among ministries, departments and agencies (MDAs) is also ongoing. National Data Center ICT Training and Capacity building for various ministries, departments and agencies are all on-going.
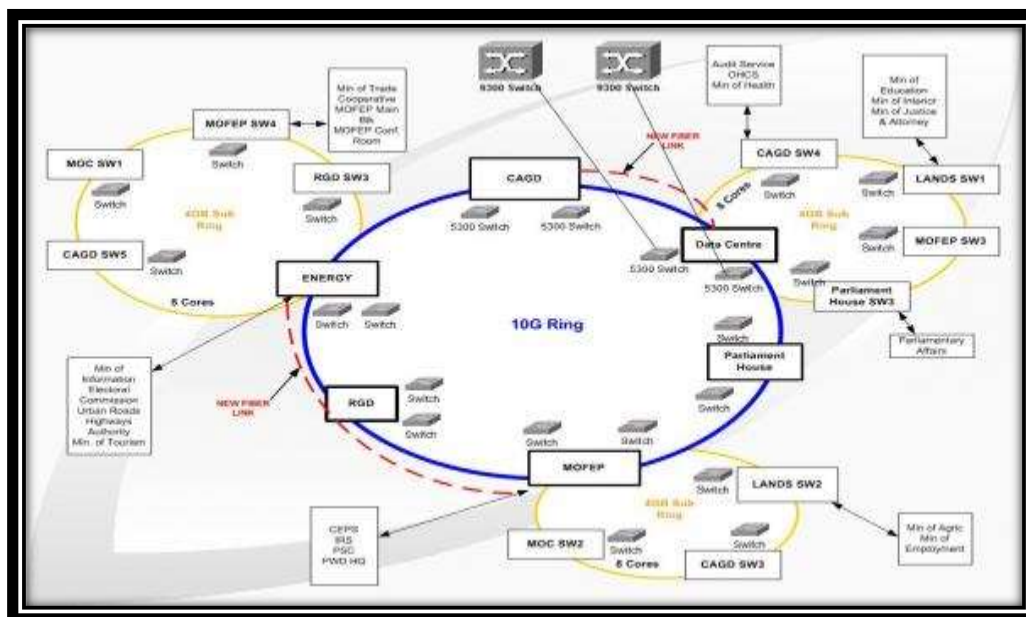
Figure 5-6: Government Wide Area Network, Source NITA: Source (Bediako, 2012)

The necessary policies and legal frameworks have also been put in place to support the rapid diffusion of E-government. Among these is the Electronic Transaction Bill passed in December 2008 to give legal backing to electronic transactions and communication through the use of digital signature, consumer protection (http://www.nita.gov.gh/pages.aspx?id=2). Other relevant policies put in place to promote E-government in Ghana are the Ghana Telecommunication Policy, 2005, National Policy on Public Private Partnership, 2011 and the National Broadband Policy is also under discussions.

Very little research has been undertaken to assess the effectiveness of most of these interventions mentioned and their impact on the various areas of governance in the counntry, hence the need to assess the E-readiness of the local government system to diffuse E-government especially in the local departments and agencies which are providing public services at the local level, and the impact of e-government in local governance in the country.

CHAPTER 6

6 A CONCEPTUAL MODEL FOR THE ASSESSMENT OF E-READINESS

6.1 Introduction

To effectively answer the research questions outlined in the introductory chapter, there is the need to find an appropriate measurement tool to assess the E-readiness of the local government institutions in Ghana for E-government diffusion. This chapter provides the conceptual framework for E-readiness assessment. A survey of the various measurement tools available showed some level of limitations which could result in the wrong picture being painted of the level of E-readiness. This study therefore, proposed an E-readiness assessment framework named Technological, Organizational, Political and Stakeholder (TOPS) model. This proposed model takes an institutional perspective of E-readiness. Each of the four major constructs has a number of predictor variables which are summed up to provide an indication of the state of the predicting indicator. The main constructs and their predicting factors used in the model have been justified theoretically and from the literature in this chapter.

6.2 An Overture to the Proposed E-readiness Assessment Model

E-readiness measurement indices and models are aimed at providing an indication of the level of preparedness of countries, institutions or communities to be active participants of the ICT revolution so as to attract the potential benefits of the ubiquity, interactivity and networking that the connected world provides (UN-DESA, UN E-government survey 2008; The Economist, 2009).

A number of studies such as Budhiraja & Sachdeva (2002), Al-Omari & Al-Omari (2006), Ifinedo (2005), Corrocher & Ordanini (2002) have been conducted to assess the E-readiness in certain developing countries. These studies often utilized the existing indices which have been developed by international organizations for inter-country comparisons. These indices may distort the findings if they are applied in a study which is aimed at purely assessing internal institutions of government for their level of E-readiness.

Despite the similarities, E-government diffusion across each country is faced with unique factors that are very relevant to the particular country to facilitate effective diffusion (Abdallah & Fan, 2012), and therefore these unique factors must be identified for the purpose

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of the assessment. A survey of existing measurement indices and models for this study identified various limitations of these indices as indicated in the study.

Ghana as a developing, lower-middle income country cannot boast of matured public sector institutions which have evolved over time and, therefore, easily adaptable to the diffusion of modern technologies as can be found in the developed countries. In developing the TOPS Model for E-readiness asessment for this study, extensive and detailed discussion of literature has been undertaken to identify major factors that influence the effective diffusion of technology in organizations. Theories about the diffusion of innovations such as Information and communication technologies have also been discussed and used to support the main constructs identified for the proposed model.

The relevance of the constructs identified in some of the existing assessment models to a developing countries has also been taken into account. The factors so identified and their predictor variables have been supported theoretically and empirically. The importance of the assessment of E-readiness for E-government diffusion in developing countries and the rationale behind the development of the proposed measurement model are presented in this chapter.

6.2.1 Importance of E-readiness Assessment in Developing Countries

Development and implementation of effective e-strategies are a sine qua non for developing countries to appropriate the potential transformation power of information and communication technologies (ICT) beyond the crafting of policy documents (CTO, 2008). The prominence gained by E-readiness assessments in E-government research underscores the role E-readiness assessment plays in E-government diffusion strategy formulation (Budhiraja & Sachdeva, 2008).

Knowledge of the E-readiness levels of government institutions is a prerequisite for crafting an effective E-government diffusion strategy to enable the transformation of government systems into high-performing and innovative systems which deliver integrated public services. This would make governance simple, moral, accountable, responsive and transparent (SMART) (Azab, Kamel, & Dafo, 2009).

Measuring E-readiness also provides policy makers a comprehensive scorecard of the digital capabilities of a country in relation to other countries in an era where the competitiveness of an economy is determined by the level of ICT utilization (West, 2007). This measure emphasizes the readiness of companies and individuals to participate in the global e-business (Molla, 2004).

The ability to plan the technological trend and the preparedness to harness the productivity gains of ICT-enabled public administration largely depend on the knowledge of current E-readiness of the public sector institutions in a country (Teltscher, 2011). Such E-readiness provides a barometer for successful E-government diffusion. The level of E-readiness is an indication of the level of information and communication technology diffusion, its use and its impact on the lives of the citizens (ECA, 2011), The E-readiness assessment also provides a comparison of information and communication technology (ICT) utilisation among institutions or among countries in the same region (Ifinedo,2005).

E-readiness does not only provide a technological barometer but facilitates an understanding of the social, economic and political influences of ICT deployment and utilization, thus explaining the different stages of development of countries (West, 2007). Applying E-readiness to the introduction of E-government provides a detailed feasibility report on the programs to be introduced indicating capabilities, resources and infrastructure required to initiate and sustain the project (Al-Solbi & Mayhew, 2005; ITU, 2011).

The Assessment of E-readiness also provides the primary positive step towards converting laudable E-government policies and programs into action for real transformation of governance, providing a guide to the development of benchmarks for comparisons and gauging progress in different parts of the country and different government organizations (Budhiraja & Sachdeva, 2002).

Effective diffusion of E-government requires knowledge of the stakeholders and information of the project implementation environment for effective planning. E-readiness analysis enables policy makers to map out e-strategic plans for improving E-readiness for effective implementation and advancement of E-government programs in a country (Ghavamifar, Beig, & Montazer, 2008).

Despite the phenomenal growth in the deployment and utilization of information and communication technologies (ICT), the concern for E-readiness has not subsided. For many a country, it is still a crucial part of the digital agenda and E-government policy discussions as evidenced in ECA, 2011; ITU, 2011; INSEAD, 2012; UN-DESA, United Nations E-Government Survey 2012.

Given the different objectives of the various indices and differences in the level of developments in each country, the use of national average figures as provided by most of the indices would not be suitable for a comprehensive analysis of E-readiness for decentralisation and local governance (Al-Omari & Al-Omari, 2006). A comprehensive E-readiness assessment in the departments and agencies at the local levels cannot therefore, be discounted

in the building and implementation of E-government in a country where decentralization has been institutionalized.

6.2.2 E-readiness Defined

The varying definitions of E-readiness reflect the different objectives of the assessments resulting in varieties of assessment tools. Shareef, Ojo, & Janowski (2008) defined E-readiness as a country's capabilities to harness the advantages of the Internet as a driver of economic growth and human development. While this definition is partially appropriate, information and communication technology is far more than just the Internet.

E-readiness has also been defined as the degree of preparedness of a community to actively participate in the networked world in order to reap the benefits of connecting to the network (UN-DESA, UN E-government survey 2008). Hence E-readiness seeks to assess the position of a country's information and communication technology infrastructure and the ability of its citizens, businesses and government itself to utilize it to their advantage (The Economist, 2009; Yunis & Sun, 2009; Docktor, 2002).

E-readiness can also be viewed as a measure of the extent to which a community and or the economy are positioned to participate in the digital economy (APEC, 2000; Abdallah & Fan, 2012). This definition however, takes an e-business perspective while Choucri et al, (2003) defined E-readiness as the ability to pursue Internet mediated value creation opportunities.

A host of studies have been undertaken on E-readiness but they are samples which provide diverse outlook of E-readiness and their emphasis. The emphasis provides the indicators that are measured.

The differences in the thematic definitions have given rise to various indices for E-readiness assessment which are mostly exclusively used internationally and at national level comparisons (Ifinedo, 2005). However, inequalities exist at various other levels such as sector, community and individual level as far as access to and adoption of information and communication technology is concerned (Al Awadhi & Morris, 2009). These inequalities are likely to have a negative impact on the implementation of any E-government policy if a one-fit-all-program is rolled out nationwide (Heeks & Santos, 2009). Most of the definitions also raise the debate on what to measure given the multiple technologies that are involved when the issue of modern information and communication technology is discussed (Docktor, 2002; Hunter, 2010).

6.2.3 The Rationale behind the Proposed E-readiness Assessment Model

Governance is information intensive, making the creation and dissemination of information particularly essential to E-government. The successful diffusion of E-government thus requires the existence of certain key facilitating conditions to inform E-government policies and implementation strategies (infoDev, 2002; Moon & Norris 2005). The Objectives of implementing E-government vary and are determined locally or nationally based on political leadership with key stakeholders significantly influencing these objectives (Heeks & Santos, 2009). Achieving such objectives is contingent on the readiness of government and its institutions as well as its stakeholders to diffuse E-government.

The level of E-readiness expected is also dependent on the type and the stage of E-government project and application being deployed (ECA, 2011). Thus the assessment of E-readiness using indicators that are relevant, possible to measure and comparable is imperative for the successful diffusion of E-government. Such indicators provide critical ingredients in the formulation of effective policies and strategies for E-government implementation (ECA, 2011).

Many a developing country is investing in information and communication technology (ICT) as a developmental tool (UN-DESA, UN E-government survey 2008) and as a catalyst for public sector reforms (Okoronkwo & Agu, 2010; Budhiraja & Sachdeva, 2002) hence the increasing need for relevant and credible E-readiness assessment towards harnessing the potential benefits delivered through E-government (Choucri, Maugis, Madnick, & Siegel, 2003; Shareef, Ojo, & Janowski, 2008).

6.3 Quality Characteristics of an E-readiness Assessment Model

E-readiness assessment can only be useful if applicable and appropriate quality assessment tools designed for the purpose are employed (Beig, Montazer, & Ghavamifar, 2007). Such assessment tools should be simple and easy to use and must be consistent with the realities on the ground. The Assessment tool should determine indicators essential for diffusion and adoption of E-government with valid and reliable scoring analysis (Straub, 1989).

6.3.1 Reliability of Assessment tools

Reliability of an assessment tool provides for replication of the individual measures from the same information source and yield replicable results when used more than once (Avkiran, 1994). A relevant tool for E-readiness assessment must therefore measure the same indicators the same way and produce consistent results making it replicable, consistent and repeatable.

Reliability could be tested through the use of internal consistency, split-half reliability, test-retest reliability and inter-rater-reliability (Allen & Yen, 1979).

6.3.2 Validity of Assessment Tools

E-readiness assessment would be considered valid if it measures exactly what it aims to measure without logical errors in drawing conclusions from the measurement (Allen & Yen, 1979). The validity of a measurement tool indicates suitability of the tool in measuring what it measures in the way it measures it. The validity of such tool can be assessed on three main grounds (Boudreau, Gefen, & Straub, 2001)

Constructs validity require that the constructs should include a theoretical basis translated and clearly operationalized into measurable indicators, ensuring there is logic in the items which are measuring a social concept (Garson, 2012). Content validity ensures the measurement instrument includes items and indicators that are relevant to content domain (Barzilai-Nahon, 2006). Criterion-related validity indicates the measurement instrument behaves as designed and expected, by measuring what it measures. This would ensure that the constructs meet the criteria for the assessment (Boudreau, Gefen, & Straub, 2001; Beig, Montazer, & Ghavamifar, 2007).

6.4 A Survey of E-readiness Assessment Tools

Several E-readiness assessment tools have been developed by international organizations, researchers, research institutions and development consultants. The objectives of these assessments vary from E-readiness for e-commerce, E-government to the state of ICT development in countries. For E-government assessment, the applicable tools measure certain aspects of the community and several features of services and technologies, the presence of which facilitate E-governance. A survey of E-readiness tool is presented below in table 6-1.

Table 6-1: Survey of E-readiness Metrics and Indices

Assessment Tool, Source and Year	Key Indicators	Purpose/objective
INTERNATIONAL ORGANIZATIONS		
(EIU, The 2002 E-readiness rankings ,A white paper from the Economist Intelligence Unit, 2002) (EIU, 2003)	Connectivity and technology infrastructure, Business environment, Consumer and business adoption, Legal and policy framework, Social and cultural infrastructure, Supporting e-services	International Comparison

Assessment Tool, Source and Year	Key Indicators	Purpose/objective
INTERNATIONAL ORGANIZATIONS		
EIU, 2007) (EIU, 2008), (EIU, 2009), (EIU, 2010)	Connectivity and technology infrastructure, Business environment, Consumer and business adoption, Legal environment, Government Policy and Vision, Social and cultural infrastructure	International Benchmarking
(ECA, 2011)	Use of ICT by employees of government, Availability of ICT to government organizations ,Use of ICT by government organizations, Supply of e-government services to citizens	International Guide
(APEC, 2000)	Basic Infrastructure and Technology Access to Necessary Services. Current type and Internet utilization, Promotion and Facilitation Activities, Skills and Human Resources, Positioning for the Digital Economy, Legal Framework	International Guide
(GeoSINC, 2002)	Access and Connectivity, Training, Education and Public Awareness, Public Administration and Government Leadership, Business and Private Sector Initiatives, Society Development	International Benchmarking
Digital Access Index (DAI) (ITU, 2003), (ITU 2009), (ITU,2012)	Infrastructure, Affordability, Knowledge (adult literacy, and school enrolment) Quality (bandwidth per capita and broadband subscribers), Usage	International Comparison and Benchmarking
(UN-DESA, Global E-government Readiness 2004, 2004)	Political, Regulatory, Organizational, Cultural, Communication And Technological Factors. Web Measure Index, Telecommunication Infrastructure Index, Human Capital Index	International Comparison and Rankings
(UN-DESA, UN Global E-government Survey 2005: From E-government to E-Inclusion, 2005) , (UN-DESA, 2008), (UN-DESA,2010)	Web Measure Index, Telecommunication Infrastructure Index, Human Capital Index, E-Participation Index	International Comparison and Rankings
(UN-DESA, 2012)	Online service index, Telecommunication infrastructure index, Human capital index, E-participation index, Environment Index	International Comparison and Rankings

Assessment Tool, Source and Year	Key Indicators	Purpose/objective
CONSULTANTS AND RESEARCH INSTITUTIONS		
McConnell International (Docktor, 2002)	Connectivity, E-Leadership, Information Security, Human Capital, E-Business Climate	National Assessment
(The 2012 Waseda University International E-government, 2012), 2007,2009,2010	Network Preparedness, Required Interface-Functioning Applications, Homepage, Chief Information Officer (CIO) in Government, E-government Promotion, (E-Participation/Digital Inclusion included in 2012)	International Benchmarking
(World Economic Forum-NEPAD E-readiness Policy Programme, 2003). Bridges.org	Tele-density (fixed and mobile), Level of telecom deregulation, Internet penetration, bandwidth availability, and cost, Conducive legal, regulatory, and fiscal frameworks, Infrastructure (communications and other), and Economic development.	National Assessment for International Comparison
(INSEAD, The Global Information, Technology Report Living in a Hyperconnected World, 2012)	Environment , Infrastructure, Usage , Impact	International Benchmarking and Comparison
Orbicom Model (Sciadas, 2005)	Info density Info-use.	Conceptual Framework for International Comparison
MIT (Choucri, Maugis, Madnick, & Siegel, 2003)	Access Capacity Opportunities	International Comparison and Benchmarking
INDIVIDUAL AND GROUP OF RESEARCHERS		
(Bui, Sankaran, & Sebastian, 2003)	Competitiveness, Macro Economy, Knowledge Citizen, Ability, willingness to Invest, Access to Skilled Workforce, Digital Infrastructure, Cost of Living and Pricing, Culture,	Framework for National Assessment
(Barzilai-Nahon, 2006)	Infrastructure access, Affordability Use, Social and governmental constraints/support, Socio-demographic factors	International Comparison Benchmarking

Assessment Tool, Source and Year	Key Indicators	Purpose/objective
INDIVIDUAL AND GROUP OF RESEARCHERS		
(Ojo, Janowski, & Estevez, Global Survey of Electronic Government; e-Macao Report 3, 2005)	Web Measure Index, Telecommunication Infrastructure Index, Human Capital Index, E-Participation Index Business environment, Consumer and business adoption, Legal environment, Government Policy and Vision, Social and cultural infrastructure	National Assessment
(Abdallah & Fan, 2012)	Information, Technology, Strategy Values, Management systems and structure Leadership, ICT skills	National assessment
(Corrocher & Ordanini, 2002)	The communication infrastructures, The human resources The competitiveness of the information and communication services providers	Framework, International Comparison
(Ifinedo,2005)	Stakeholders ,Demand for E-government; Supply of E-government; ,Technology; National, Federal, Local, Community and International Context; Enabling Environment; and Perceptions, Willingness and Challenges	Framework for National and International Assessment
(Al-Omari & Al-Omari, 2006)	Context, connectivity, capability, and content	National Assessment
(Azab, Kamel, & Dafo, 2009)	Availability and the maturity technical infrastructure in various government departments ,Civil service ready to reengineer, share information and treat citizens as customers , Internet penetration Legal framework ,support government mandate for online transaction , Political commitment from departmental managers and champions , Awareness of citizens	Framework for National Assessment
4Cs Model(Grigorovici, Constantin, Jayakar, Taylor, & Schement, 2004)	Connectivity Capability Content Context	International Comparison
Component Based Model: (Shareef, Ojo, & Janowski, 2008)	Stakeholders, Technology, Demand, Supply International Context, National and Local Context, Enabling Environment, Perceptions	Framework for International and National Assessment

INDIVIDUAL AND GROUP OF RESEARCHERS		
Networked Readiness Index (NRI) (Kirkman, Osorio, & Sachs, 2002)	Network Use (quantity and quality of ICT use) Enabling Factors(Network Access, Network Policy, Networked Society Networked Economy	International Comparison
(Molla & Licker, 2005)	Organizational, Environmental	National Assessment

6.5   Limitations of the Existing Tools for this Study

The pioneering contributions of E-readiness assessment have gained wide usage with modified versions for both domestic and international assessments. A survey of these assessment tools reinforces the criticisms that some of these metrics and frameworks are fraught with uncertainties and ambiguities in practice and lack robust theoretical basis for empirical analysis (Barzilai-Nahon, 2006) rendering them almost irrelevant to business and government and obscuring the realities on the ground (Gatignonet al, 2002).

Again most of the existing E-readiness studies and attendant proposed models, frameworks and metrics assume fixed, one-size-fit-all sets of requirements and indicators that do not take into consideration the distinctive characteristics of the individual countries, different regions of the country, different institutions involved and or their needs at the time of assessments (Beig, Montazer, & Ghavamifar, 2007).

Choucri et al, (2003) also argued that most E-readiness studies seem to provide limited explanations of the methodology used in the construction of the indices and the way to customize them to suit a particular situation. Whilst most E-readiness indices are aimed at international and national levels, there exist inequalities at sectorial, departmental, community and individual levels which the national score does not disclose (Dewan & Riggins, 2005).

The existing indices focus on national averages and data, thereby ignoring comprehensive data collection and analysis from the departmental and community levels (Dada, 2006). In the developing countries, many districts, provinces and communities far removed from the cities and capital do not have the same access to information and communication technologies and usage (Barzilai-Nahon, 2006). These inequalities are likely to have a negative impact on the implementation of any E-government policy if a one-fit-all programme is rolled out nationwide.

One of the problems of the different E-readiness assessment models is that different measurements produce different rankings such that the problem of E-readiness measures,

once again, is a question of clarifying definitions for the concepts used, using a solid theoretical framework when constructing indicators and resolving the issues of different results from different measurements (Vehovar et al, 2006).

6.6   Conceptualizing an E-readiness Assessment; The TOPS Model

The barrage of criticisms of the existing E-readiness metrics for internal and inter-country assessment makes it imperative for the development of an appropriate assessment tool for institutional E-readiness assessment for E-government diffusion. This model would provide a tool that would look beyond national data usually emanating from official sources. These data are generally estimates and national averages which give distorted views of the existing situation in certain parts and institutions in a country. This model proposes the utilization of primary data collected on the local government and decentralised institutions for the assessment.

The first step of selecting the key indicators for the framework was to compare various assessment models and tools to identify relevant and consistent indicators that drive E-government diffusion. These indicators are justified in the theoretical framework used in the study. The Technology, Organization and Environmental Framework (Tornatzky & Fleischer, 1990), Stakeholder Theory (Flak, Nordheim, & Munkvold, 2008) Diffusion of Innovation Theory (Rogers 2003) and Institutional Theory (Teo, Wei, & Benbasat, 2003; Westphal, Gulati, & Shortell, 1997) thus provide the theoretical justifications for the proposed key indicators.

The major indicators are operationalized into several predictor variables with such predictor variables or sub-indicators justified from literature and other theoretical and empirical studies. This conceptual model determines conditions facilitating technological innovation diffusion, factors that contribute to institutionalisation of innovation in organizations and the organizations' analysis of their stakeholders for effective diffusion of E-government.

6.7   Justifying the Key Constructs of the E-readiness Assessment Model

This framework identifies four main key indicators as constructs to be assessed from the diffusing institution's perspective. These are Technological, Organizational, Political and Stakeholder readiness. The technological and organizational readiness is internal to the diffusing institution and thus, classified as institutional readiness while political and stakeholder readiness are outside the control of the diffusing entity and therefore, classified as exogenous readiness. The predictor variables were selected based on their contribution to the

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measurement of the key indicators based and also on various theoretical and empirical assessment tools surveyed.

Table 6-2: Constructs for TOPS Assessment Model

E-readiness	The Key Constructs	Relevance/Theoretical Support	Value Assigned
Institutional E-readiness	Technological Readiness	TOE Framework, DOI Theory	30
	Organizational Readiness	TOE Framework, DOI Theory Institutional Theory	25
Exogenous E-readiness	Political Readiness	DOI Theory, TOE Framework	25
	Stakeholder Readiness	DOI and Stakeholder Theories, TOE Framework,	20

6.7.1 Selection of the Indices

Diffusing E-government as a tool for decentralisation would involve the utilization of information and communication technology in public services delivery (E-services) public administration (e-administration) and interactions and citizens participation in governance (e-democracy) (Heeks & Santos, 2009; Macintosh, 2003). These require the reengineering of both the local and national public administration for optimal delivery of services, citizens' participation and internal government processes through E-government (Tang, Miao, & Xi, 2010). This makes the indicators interdependent and complex ranging from technical, socio-political to economic issues (Vosloo & Van Belle, 2005).

E-government is evidently a technologically enabled innovation (Ahn & Bretschneider, 2011); hence increased emphasis is placed on technological readiness by the proposed model. The model acknowledges the differences in the key indicators and their impact on the successful diffusion of E-government in local government and these are evidenced in the frequency of the usage of the indicators from the various theoretical and empirical assessment tools surveyed.

6.8 Institutional Readiness

The successful implementation of E-government as a tool for decentralization requires that the institution delivering E-governance is E-ready. This study identifies technological as well as organizational readiness as significantly contributing to institutional readiness for E-government diffusion (Zhu, Kraemer, & Xu, 2006). There is evidence of correlation between

institutional readiness and successful diffusion and institutionalisation of E-government (Nurdin, Stockdale, & Scheepers, 2012).

6.9 Technological Readiness

Technological readiness thus measures the existence and the state of technologies available to decentralised departments in the local government area which support internal management efficiency, e-service delivery and e-participation (Al-Wadhi & Morris, 2009; Orlikowski & Baroudi, 1991).

The access to and usage of information and communication technology (ICT) remain key drivers and preconditions for deriving the requisite impacts in any institution (WUIeG, 2012). The existence of such ICT infrastructure and services is a prerequisite for effective diffusion and institutionalization of E-governance in local government (Azab, Kamel, & Dafo, 2009; ECA, 2011). An assessment of the state of ICT infrastructure and services would inform local as well as national decision makers on the diffusion strategy to adopt if E-government is to be used to improve the management, service delivery as well as decision making process (Heeks & Santos, 2009).

For the purpose of this assessment model, technology is defined as a set of physical technical resources, including shared technology and technology services across organizations which provide a basis for E-government diffusion (Zhu, Kraemer, & Xu, 2006). This includes all necessary technologies such as hardware, software, communication and networks infrastructure, internet penetration, software applications and the current organization's technology and electronic systems which would support the e-initiative (Abdallah & Fan, 2012; Bui, Sankaran, & Sebastian, 2003). To determine the technological readiness, the following predictor variables would be assessed.

Table 6-3: Predictor Variables for Technological Readiness

Predictor Variables	Value Range
Availability of Telecommunication Networks (fixed/wireless)	0-5
Access and Quality of Internet Connectivity	0-5
Web presence (Existence of Website/Email)	0-5
Level of Automation	0-5
Reliability of ICT Infrastructure and Services	0-5
Expertise and Technical Support Staff	0-5

6.9.1 Availability of Telecommunication Networks (fixed/wireless)

The importance of telecommunication infrastructure in the diffusion of E-government is evidenced in all indicators identified in the survey of E-readiness indices. While most refer to the public infrastructure, this indicator looks at the infrastructure availability at the institutional level.

Implementing E-government anywhere requires quality network backbone either fixed or wireless; hence access to telecommunication infrastructure and services is essential for the diffusion and adoption of E-government both at the national and local levels (Bekkers & Homburg, 2005; ECA, 2011).

Where there is difficiency in this indicator, it must be ratified in order to move to another focus area of E-government implementation since the foundation of any such innovation rests on it (EIU, 2009; Mzyece, 2012). While wireless communication is emerging as connectivity solution for developing countries, the quality and its affordability has a significant impact on diffusion of E-government for local governance. The need for such infrastructure that supports broadband internet connectivity cannot be over-emphasized for the success of local E-government (ITU, 2011).

6.9.2 Access and Quality of Internet Connectivity

While the existence of the telecommunication infrastructure is a critical step towards the ability to diffuse E-government, the existence and the quality of Internet connectivity takes the readiness to a higher level (Calista & Melitski, 2007; Budhiraja & Sachdeva, 2008).

The affordability of internet connectivity both from accessing through wireless or fixed broadband is also essential for an institutional capacity for E-government diffusion (INSEAD, 2012). While access and quality are essential, the affordability to the institutions is essential if running cost of the E-government project would be minimised to ensure return on investment (Al-Solbi & Mayhew, 2005; Akakpo, 2008).

6.9.3 Web Presence (Existence of Website and Email Systems)

The emergence of web technology has had an immense impact on electronic service delivery and interaction (Scott, 2006; infoDev/World Bank, 2009). The World Wide Web facilitated by advances in the web technologies provides an effective medium for E-governance. With a strong web presence, local authorities and decentralised departments could make life easier for citizens and other stakeholders through the provision of timely government information and services which could lead to reduction in corruption (Criado & Ramilo, 2003; Asgarkhani, 2005). For government institutions, the web provides the opportunity for

interacting with government services without intermediaries and also links decentralised departments and agencies with other government agencies. This homogeneous linkage to technology, policy and organizational management promotes both intra and inter-organizational integration with applications such as e-mail providing a fast, effective and instant communication tool (Rahman, 2010; Cassell & Mullaly, 2012).

Web presence would involve preferably official websites with links to other ministries and departments as well as the national and regional departments and agencies. The maturity of websites and their capabilities in the provision of E-governance has been emphasized by Ifinedo, 2005 and UN-DESA, 2012. Web presence could be categorised into five stages of maturity, namely emerging, enhanced, interactive, transactional and connected stages (UN-DESA, 2012). The importance of web presence or online presence can empirically be found also in Kirkman, Cornelius, Sachs, & Schwab (2002), Ojo (2005) and Grigorovici et al. (2004).

One of the critical areas of web presence is the use of the social media, with the growing number of social media users (Jaeger, Bertot, & Shilto, 2012). The social media would continue to play a vital role in E-governance especially in the area of e-participation and e-engagements in the immediate future since it provides high interactivity, immediate feedback and ubiquity (Bridgesa, Appela, & Grossklags, 2012).

6.9.4 Level of Automation of work processes

E-government requires the development and implementation of back office processes, internal networks, databases and information to facilitate e-service delivery and e-management, and provides the foundation for e-participation (Beig et al, 2007).

Information and communication technology has been used in government departments for various routine operations as back-office applications. This early automation contributed to the enhancement of efficiency and effectiveness by facilitating storage, processing and management of public data (Ha & Coghill, 2008). IT departments also automate the existing operational processes by replacing manual work with computer data processing (Calista &Melitski, 2007). The development of computers with higher computing power at affordable prices resulted in the widespread diffusion of computers in the public sector leading to the introduction of transaction processing and decision support systems running on the back of local area networks (Moon, Lee, & Roh, 2012).

The first stages of E-government diffusion, involving the processes of modernization of the public sector from paper-based tasks to digitized processes, do benefit from the existence of

an automated process. Where it does not exist already, automation is needed for the subsequent stages of E-government to evolve (Fang, 2002; Chuna et al, 2010).

Successful diffusion of E-government as a tool for decentralization would require local governments and public sector departments to radically re-engineer and automate work processes (Ojo, Janowski, & Shareef, 2009). The level of internal automation would provide an indication of the level of technological readiness for the diffusion of E-government (Abdallah & Fan, 2012; Bekkers & Homburg, 2005).

6.9.5 Expertise and Technical Support

The level of expertise and technical knowhow available to an institution provide the necessary foundation for E-government diffusion (ITU, 2012; ECA, 2011). These are needed for initial diffusion, continuous refinement and adjustments to organizational and stakeholder needs (Flak, Nordheim, & Munkvold, 2008; Kamal, 2006). Organizations with better ICT expertise and or better technical support, therefore have a higher tendency to diffuse technological innovation such as E-government (Bui, Sankaran, & Sebastian, 2003; Docktor, 2002). Among the studies providing empirical evidence of organizational ICT skills and technical knowledge and the possibility of successful E-government diffusion are Sagheb-Tehrani (2010), Carter (2008) and Abdallah & Fan (2012).

6.10 Organizational Readiness

For effective diffusion of E-government to promote decentralisation, there is the need to understand the state of the local institutions and institutional options that would encourage and institutionalize E-government innovation (Dacin, Goodstein, & Scott, 2002; Dasgupta & Gupta, 2010). Basic institutional framework recommends the consideration of institutional leadership and culture. The strengths and weaknesses of the institutional leadership and culture provide inputs to the fashioning out of the necessary institutional mechanism and competencies for E-government diffusion (Hanna, 2007).

Organisational readiness for E-government diffusion assesses the compatibility of this technological innovation with the existing operating practices, beliefs, values, experience and needs of the diffusing organizations (Rogers, 1995). This is done by identifying the presence of organizational factors that support the implementation of E-government (Teo, Wei, & Benbasat, 2003; Tornatzky & Fleischer, 1990). The compatibility of organizational policy and technological innovation can therefore, not be underestimated (Rogers, 2003) for diffusion of E-government.

E-government could provide myriads of benefits for local governance such as increase in the delivery of and access to services at a significantly reduced cost, collaboration among various local departments and agencies of government (Reddick, 2009). The achievement of these however, depends on the willingness and readiness of both the local and national civil service to reengineer and deal with citizens and other stakeholders as customers (Dasgupta & Gupta, 2010).

To assess organizational readiness for E-government diffusion, five predictor variables were identified, the existence of which would facilitate the diffusion of E-government as a tool for decentralisation. The choice of the variables was based on the frequencies in the assessment tools surveyed and supported by the theories used in this study.

Table 6-4: Predictor Variables for Organizational Readiness

Predictor Variables	Value Range
Administrative Competence	0-5
E-Leadership	0-5
Organizational Awareness and Culture	0-5
E-Strategy	0-5
Budget and Resource Allocation	0-5

6.10.1 Administrative Competence

Competent managers are responsible for creating an organizational culture that drives and rewards innovation. Since innovation requires some level of risk taking, competent managers should be prepared to take some risk to innovate their departments (GeoSINC, 2002; Abdallah & Fan, 2012). In organizations where there is extreme fear of failure, managers are less likely to diffuse innovation by taking risks, and this would have a negative impact on E-government diffusion (Ifinedo, 2006; Azab, Kamel, & Dafo, 2009)

Local governments and their departments suffer from lack of qualified personnel especially in developing countries where qualified and competent people do not easily relocate to a non-urban local authority area to work (Ahwoi, 2011). This might often leave less qualified managers in such areas, thereby hindering innovation diffusion (Amadu, 2004; Ofei-Aboagye, 2001). Such local managers and departmental heads in developing countries often tend to have vested interests in and benefit from the status quo and hence are not in a hurry for innovations such as E-government (Moon, 2002). Competent and innovative managers and heads of departments would be crucial in diffusing E-government at the local levels (Ojo, Janowski, & Estevez, 2005; Rahman, 2010).

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Often incompetent and less qualified local managers and heads of department oppose innovations such as E-government for fear of its impact on their powers. Qualified and competent managers would be predisposed to stimulating E-government innovation to achieve efficiency and effectiveness in local management and service delivery (Azab, Kamel, & Dafo, 2009; Shareef, Ojo, & Janowski, 2008). Local governments and decentralized departments approach technological innovation from different perspectives with different propensity to innovation diffusion. Local governments and departments with a management culture of high propensity for innovation would likely value E-government and diffuse it (Moon & Norris, 2005).

6.10.2 E-Leadership

The inertia in civil and public services delivery in the developing countries makes it imperative for political commitment from the top managers or heads of the institution for successful diffusion of E-government in local governance to promote decentralization (Saidi & Yared, 2003; Estevez & Janowski, 2013). Such a local e-leader in the department or agency would drive the initiative, support and sustenance of E-government diffusion (GeoSINC, 2002; Hanna & Knight, 2012). E-Leaders and e-champions are therefore managers of ministries, departments and agencies (MDAs) who fully understand the critical role of E-government for efficient and effective management and service delivery and the objectives of the central government to ensure its successful diffusion (Hanna, 2007).

An E-leader would engender trust and ownership in the diffusion process and avoid the problem of resistance to change and technology associated with implementing innovation of the civil and public services (Docktor, 2002), and serve as point of contact for inter and intra departmental interaction and communications with regard to the implementation process (Trivedi & Desai, 2012). E-Leadership thus facilitates organizational adaptation to the challenges of the information age and shows a commitment to such e-transformation (Clark, 2003). E-leaders can be individual leaders ranging from CIOs to CEOs and they are determined by their attitude, knowledge and experience of e-transformation of the public services (Kifle & Low Kim Cheng, 2009).

E-Leadership is imperative as the goals, possibilities and aspirations of E-government become broader and the corresponding challenges in developing and implementing E-government programs increase (Auffret et al, 2010; Estevez et al, 2011).

Hanna (2007) argues that individual e-leadership may not be enough to carry through E-government innovation, but the vision must be institutionalized with the mechanism to make

the E-government visions implementable and sustainable. A good e-leader may not be able to make the significant changes required alone unless appropriate governance and institutional structures are put in place (Hanna, 2007). Institutions, therefore, play a very crucial role in identifying, attracting and developing potential e-leaders to support and empower them to construct an enabling environment for stakeholders of E-government diffusion (Anwaruddin, 2013).

6.10.3 Organizational Awareness and Culture

The post-independent civil service in most developing countries has not seen significant changes comparable to the potential changes through E-government (Ahn & Bretschneider, 2011) and E-governance would require new skill sets and habits to facilitate the diffusion and sustenance and institutionalization in current organizational systems (Auffret et al 2010).

The analysis of existing service delivery methods, its stakeholders and public expectations of an organization provides insight into its approach to E-government adoption (Ahn & Bretschneider, 2011). Public funded organizations tend to be less innovative while self-funded public organizations tend to drive toward efficiency and are more likely to adopt E-government (Ali, Weerakkody, & El-Haddadeh, 2009).

The level of an organization's awareness of government policies towards E-government diffusion and adoption drives the E-government diffusion strategies in such organizations. Such organizations might have even been preparing to respond to the government, donor or even citizens' demand for such services (Raguseo & Ferro, 2011). This assessment facilitates the development of an advocacy and awareness program within the organization and among its stakeholders for the diffusion and adoption of E-government (APEC, 2000; Barzilai-Nahon, 2006). In addition to building institutional technological capabilities for E-government implementation, the development of widespread awareness within the organization and its stakeholders is extremely crucial to a successful implementation of E-government (Arpaci, 2010).

6.10.4 E-Strategy

E-strategy has attracted the attention of E-government researchers and experts since the promulgation of national policies does not necessarily lead to institutional reengineering and diffusion of E-government (Chen & Bai, 2011). Successful diffusion of E-government thus requires the development of a strategy that takes into consideration local and national needs for adaptations (Al-Omari & Al-Omari, 2006).

The ability to identify the need for the development of an e-strategy would be considered a key determinant of the innovative competency of an institution. An e-strategy consisting of a comprehensive business process reengineering (BPR) plan would identify processes and services that can be efficiently and effectively delivered through E-government (De Juana-Espinosa, Claver-Cortés, & Tarí, 2012) which is an essential springboard for an institutional E-government diffusion (Dasgupta & Gupta, 2010). E-government objectives cannot be simply achieved by drafting policies, laws or command by leadership; it requires a holistic institutional long term plan, strategy and resources showing the commitment and willingness to change (Mishra & Mishra, 2012; Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

E-government diffusion is often criticized for primarily concentrating on the supply side and the technological possibilities while relegating user-need to the background. E-strategy, therefore, should include a level of user centricity by tailoring the service delivered to users served by a particular government institution or a particular local authority. Such demand oriented approach could contribute to successful diffusion and utilization of E-government-services (Verdegem &Verleye, 2009; Hanna, 2011).

One critical success determinant in E-government diffusion is the ability of multiple and diverse government institutions to share and integrate across organizational boundaries, an e-strategy identifying such an organization and the approach to and standards in information sharing is essential (Daniel & Wilson, 2003; Homburg & Dijkshoorn, 2010).

6.10.5 Budget and Resource allocation

Lack of financial resources had been identified as a major impediment to E-government diffusion in both national and local governments (EL-Haddadeh et al, 2010). For Governments, competing demands mean competing resources, hence the funding and resource allocated to E-government diffusion is an indication of the priority and commitment to it (Grigorovici et al, 2004). Although E-government diffusion may be perceived as expensive, states and organizations with a budget and resources allocation plan for E-government have the ability to innovate through E-government since it requires investments in technical and administrative structures (Tolbert, Mossberger, & McNeal, 2008; Gallego-Álvarez et al, 2010).

Investment in E-government is an input indicator and signifies readiness of a government and or its department to diffuse it. Where local government authorities have no or negligible budget for investment in ICT is a clear indication that such an entity is not ready for E-government diffusion (Khadaroo, Wong, & Abdullah, 2013).

Local governments are faced with the dilemma of adopting technology-enabled service delivery for services traditionally delivered over the years. Given the cost of technology and capabilities required, local governments might not be willing to experiment and thus allocate resource to other issues especially when constrained by the budget (Bhatnagar, 2003; Kaylor, Deshazo, & Eck, 2001). Budgeting and financial resource allocation are an indication of an organization's intentions to adopt and diffuse E-government (Zheng et al, 2012; Hashim, 2010) since financial considerations are critical within an organization and government for the diffusion of E-government (El-Haddadeh, Weerakkody, & Al-Shafi, 2013).

6.11 Political Readiness

Institutional theorists attest to both internal and external pressures as influencing the evolution of organizational change and hence innovations in them (DiMaggio & Powell, 1983; Korteland & Bekkers, 2007). These pressures, according to DiMaggio & Powell (1991), could be coercive pressure compelling organizations to adopt certain policies or to innovate. Coercive pressures in the hands of political authorities contribute significantly to innovation diffusion in public organizations (Deephouse, 1996; Nurdin et al, 2012).Coercive pressure is the power that the political system has over the local authorities and departments which depend on it (Nurdin et al, 2012).

Governments possess coercive powers that could compel public sector organizations to diffuse E-government as a tool for decentralization. Such coercive powers could be manifested in the form of regulation and legislation, ICT standards as well as funding and sanctions (Heeks & Stanforth, 2007; Kim, Kim, & Lee, 2009).

The readiness of the political system to support E-government diffusion by the state and local organization therefore, contributes significantly to E-readiness for E-government implementation as evidenced in EIU (2008), GeoSINC (2002), Barzilai-Nahon (2006), Ojo, Janowski, & Estevez (2005), Ifinedo (2005) and Azab, Kamel, & Dafo (2009) among other studies and E-readiness assessment tools.

The predictor variables for political readiness were identified from various literature and frequencies of their use in other assessment tools and adapted to suit this study based on the their relevance to the theories used .

Table 6-5: Predictor Variables for Political Readiness

Predictor Variables	Value Range
National Resource Allocation	0-5
National E-Leadership	0-5
National E-Strategy	0-5
Legal and Regulatory Framework	0-5

6.11.1 National Resource Allocation

The demands of E-government, from technological infrastructure to process re-engineering required at all levels require national financial commitment from the highest political authority since a bottom-up approach might not be sufficient to deliver the change envisaged (Moon & Norris,2005) especially in developing countries still heavily dependent on the central government for their financial survival (Crawford, 2004).

Transforming government institutions from manual processes and mechanical use of technology (Bekkers & Homburg, 2005) to E-government and E-governance would require investment from the government budget allocation that would propel government institutions and individuals to adopt E-government (Bjørn & Fathul, 2008). The degree of central government's financial and other support has direct impact on the capacity of local government and decentralised institutions to implement E-government innovation (Teo, Wei, & Benbasat, 2003;Tornatzky & Fleischer, 1990).

Such resources can include technically trained personnel, financial resource and technical equipment. This will increase the propensity of local authorities and agencies to adopt and diffuse E-governance (Moon, 2002). Resources and technologically endowed government institutions would be far more ready to diffuse E-government with such capabilities those without them (Moon & Norris, 2005).

Central governments especially in the developing countries continue to exercise considerable control over the financial resources at the local levels especially where decentralisation is not very strong (Cheema & Rondinelli, 1983). Local governments continue to be considered as tools for achieving central government policies on local representations rather than as autonomous entities representing the local population (Nurdin et al, 2012).

Commitment of resources from the national level is a clear indication of readiness to diffuse E-government innovation. This is also supported by a number of indices albeit with different nomenclature such as in EIU (2008), APEC (2000), Barzilai-Nahon (2006), Azab, Kamel, & Dafo (2009), Docktor (2002) among others.

6.11.2 National E-leadership

National e-leadership is considered the highest political E-government champion (Clark, 2003) who not only influences but rallies the support of stakeholders while following up and monitoring E-government diffusion process to achieve the desired goals (Calista & Melitski, 2007). The need for strong national e-leadership stems from the fact that diffusion of E-government involves the reengineering and innovation of existing civil and public service organizations (Budhiraja & Sachdeva 2002). These would require significant investment, thus e-leadership mostly at the level of head of government (Rose & Grant, 2010; Saidi & Yared, 2003) is required especially in the developing countries to provide the necessary vision and direction of the E-government agenda at all levels of government (Mensah, 2005; Bjørn & Fathul, 2008).

In countries where there is a weak form of decentralisation such as in Ghana (Ayee, 1997), governments play an active role in the innovation of local government institutions. Political leadership initiative (Saidi & Yared, 2003) sometimes at the level of the head of state or a prime minister helps in prioritising the E-government diffusion (Ke & Wei, 2004). Even in the developed countries strategic planning for E-government was done at the ministerial levels to give national leadership as found in Denmark (IDABC, 2006; Frelle-Petersen, 2010) and in Singapore (ITU,2009; PCIP, 2004; Ha & Coghill, 2008).

High level e-leadership is required to counter the hesitations of government institutions to make their organization more accessible to other institutions. Diffusion of E-government thus requires whole government approach to avoid compartmentalised E-government implementation in individual ministries, departments and agencies (Kifle & Low Kim Cheng, 2009). The existence of national e-champion and E-leadership at the highest political echelon ensures strong focus while directing, pushing or encouraging the public sector constituents to move forward and hasten the implementation process of E-government (Kifle & Low Kim Cheng, 2009; Arpaci, 2010; Luk, 2009).

E-government might require mandatory diffusion by ministries, departments, agencies and local authorities (DiMaggio & Powell, 1991), E-leadership from the central government is therefore, a clear indication of the readiness to exert the necessary coercive powers and the commitment to the diffusion of E-government in the local government systems (Dasgupta & Gupta, 2010; Nurdin et al, 2012). The success in the diffusion of E-government therefore, is highly dependent on the commitment and innovativeness shown by the central government and the political leaders who are in government (Schuppan, 2009).

6.11.3 National E-strategy

E-government diffusion is a multi-faceted endeavor with key interdependent factors among which are enabling policies and strategies which serve as catalysts (Hanna, 2007). A national e-strategy is the overall guide to policies, investments and implementation mechanisms of E-government as a tool to ensure that the objectives outlined in the E-government or e-development policy of a country are achieved (Hanna, 2011). National e-strategy pinpoints the actions and resources of various stakeholders particularly the E-government priorities, specifying the involvement of government, private sector, public interest groups and academia in the E-government agenda (Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

It is not enough to craft E-government policy. Such policy needs to be operationalised. The successes of E-government diffusion in countries such as Denmark is reflected in the e-strategies adopted (OECD, 2010; IDABC, 2006; ITU,2009; Danish eGovernment Strategy 2011-2015; The Digital Path to Future Welfare, 2011).

E-strategy embodies an information and communications technology (ICT) standard and interoperability frameworks that would enable both intra and inter organization E-government systems to work effectively (Schware & Deane, 2003). National E-strategy also includes E-government enterprise architecture which is consistent with the emerging socio-technical view of E-government (Pardo, Nam, & Burke, 2012).

E-strategy typically comprises of, among other things, leadership and vision, alignment of E-government with public sector reforms, resource availability and constraints, a supportive framework facilitating diffusion (Chen & Bai, 2011) and resource prioritization (Mutula & Mostert, 2010).

The critical importance of e-strategy to successful diffusion is expressed in diverse ways in GeoSINC (2002), Ojo, Janowski, & Estevez (2005), EIU (2008), Azab, Kamel, & Dafo (2009) and Shareef, Ojo, & Janowski (2008).

6.11.4 Legal and Regulatory Framework

The radical transformation E-government triggers in public sector service delivery processes and the way stakeholders interact with the government raise legal and regulatory issues (Krishnan & Teo, 2012). The presence of comprehensive legal and regulatory frameworks engenders confidence and trust among the stakeholders of E-government diffusion (Gebba & Zakaria, 2012). E-government diffusion thus requires enforceable and binding regulations and legislative instruments (Okoronkwo & Agu, 2010) to deal with the radical changes it eventually introduces in governance (Touray, Salminen, & Mursu, 2013). Laws covering

digital signature, electronic communication, data protection and privacy are needed and enforceable for E-government to thrive (Rana, Dwivedi, & Williams, 2013), the absence of which severely hinders the development and progression of E-government diffusion (Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

Most government organizations were created by and operated under particular laws and rules. These rules and laws existed long before the technological revolution. Such rules might be outmoded and might hinder E-government deployment or adoption of E-government as a tool for decentralization. These laws include those such as local government law defining the relationship between the central government and the local authorities, resource allocations, procurement laws as well as voting laws (Gil-Garcıa & Pardo, 2005; Mitrou, Gritzalis, & Katsikas, 2002).

Regulatory support has proven to be a critical factor for E-government diffusion and institutionalisation. This is because often public sector institutions require some level of coercive pressures to meet certain standards or targets (Eom, 2012). Such coercion for E-government diffusion and institutionalisation could emanate from the central government as a regulator, policies from government appointed professionals or legislative pressures (Mitrou, Gritzalis, & Katsikas, 2002; Dooling, 2011). The significance of legal and regulatory laws for E-readiness is also evidenced in EIU (2003) EIU (2009) APEC (2000) Ojo, Janowski, & Estevez (2005) and Azab, Kamel, & Dafo (2009).

6.12 Stakeholder Readiness

Governance is inherently complex, with the public and civil services dealing with various stakeholders (Ahn & Bretschneider, 2011). These complexities often find their way into radical and innovative reforms such as E-government diffusion. These stakeholders in E-government are with multiple value dimensions namely, financial, political as well as social (Flak, Nordheim, & Munkvold, 2008). E-government diffusion must therefore, take into account the roles, expectations and the powers of these stakeholders in designing and implementing E-government programs (Clark, 2011) (Scholl, 2002).

A stakeholder has been defined as any group or individual who could affect and be affected by the process towards achieving organizational objectives (Harrison & Freeman, 1999). The stakeholder theory is gradually gaining root in E-government research and strong recommendations for determining stakeholder requirements in E-government projects and diffusion process (Kamal, Weerakkody, & Irani, 2011).

The development stakeholder topology based on their salience (Mitchell, Agle, & Wood, 1999) to ensure the negotiations of competing perspectives and potential conflicts before and during implementation is thus essential (Scholl, 2002). Modeling stakeholder relationships and the assessment of their readiness for the adoption of the innovation is crucial to the successful diffusion of E-government (Arpaci, 2010).

Among the stakeholders identified in E-government diffusion are service users, citizens, businesses, public servants, politicians (Luk, 2009; Basu, 2004), civil society and non-profit organizations as well as information technology systems developers and vendors (Rowley, 2011). The readiness of these stakeholders without whose acceptance and utilization E-government would not make the desired impact is thus crucial for successful diffusion (Heeks & Bailur,2007; Kamal, Weerakkody, & Irani, 2011; Gouscos et al, 2007).

The knowledge of stakeholder readiness would also enable the respective government institution to put in place measures to make stakeholders acquainted with the diffusion (Manoharan, 2012) since E-government diffusion has a potentially radical impact on government stakeholders (Choucri et al, 2003; Luk, 2009).

The predictor variables for stakeholder readiness were identified from various literature and frequencies of their use in other assessment tools and adapted to suit this study based on the their relevance to the theories used.

Table 6-6: Predictor Variables for Stakeholder Readiness

Predictor Variables	Value Range
Access to Telecommunication Infrastructure/Services	0-5
Stakeholder Awareness	0-5
Capacity for Utilization	0-5
Socio-Political Culture	0-5

6.12.1 Access to Technological Infrastructure and Services

There is unanimity in the recognition that access to technological infrastructure and service are the foundation for E-government uptake among stakeholders as evidenced in Ojo, Janowski, & Estevez (2005), Abdallah & Fan (2012), Corrocher & Ordanini (2002), Al-Omari & Al-Omari (2006), Grigorovici et al. (2004), Docktor (2002), Kirkman et al. (2002) among other studies. The strategic goal of e-government is to simplify governance by developing and deploying technologically enabled service delivery and communications channels between governments and their stakeholders. This requires access to technological

infrastructure and services capable of supporting and enabling E-government by all the stakeholders concerned (Bjørn & Fathul, 2008).

The availability of and access to telephone, both mobile and fixed, Internet broadband, wireless or fixed, the quality and the cost of these services are vital for targeted stakeholders if E-government is to achieve its desired impact (Dada, 2006; Basu, 2004). The availability of multi-channel access to E-governance providing stakeholders' choices with necessary support for stakeholders with little experience with technology should be in place in E-governance uptake (Chan et al 2010; Hill & Shirley-Ann , 2003).

This predictor analyses stakeholders' access to telecommunication networks and services. This is done by determining whether stakeholders are within a coverage area of a network infrastructure, personal ownership of terminal equipment such as phones, both mobile and fixed, personal computer, access to the internet and the quality of the internet (Helbig, Gil-García, & Ferro, 2009). This would give the picture of the interventions required in the area for stakeholder uptake of e-services.

National data which is made up of average figures have been used as a standard indicator of access to telecommunication service for a variety of E-readiness frameworks and indices, and it has been repeatedly shown to be a key precursor for E-government development and implementation (Kottemann, 2011). While television and radio contribute to the democratization process, access to high speed internet, both fixed and wireless at an affordable cost is considered essential for E-government uptake among stakeholders (Srivastava & Teo, 2007).

Knowledge of the state of accessibility of telecommunication infrastructure and services would inform the government of the e-strategy required in developing ICT infrastructure required for successful implementation of E-governance (Barzilai-Nahon, 2006; Sciadas, 2005).

All the indices point to successful E-government implementation in countries with well managed internet backbone and international gateway with developed fiber-optic network for efficient broadband communication (ITU 2011; Bwalya, 2009). There are evidences in a number of E-readiness assessment tools pointing to access to technological infrastructure and services as a prerequisite for successful implementation of E-government (GeoSINC, 2002; INSEAD, 2012; ECA, 2011; EIU, 2009; APEC, 2000).

6.12.2 Stakeholder Awareness

The successful diffusion and adoption of E-governance is precipitated by the volume of interaction between stakeholders and the government beyond the mere deployment of E-government infrastructure and applications (Shareef et al, 2011). E-governance does not necessarily result from simply drafting a policy or issuing a command. It requires strategies, plans and resources to inspire attitudinal change both from the government and the stakeholders (Ahn & Bretschneider, 2011; Fedorowicz, Gogan, & Culnan, 2010). Governments have often initiated the E-government transformation process without stakeholder knowledge who are often used to the business-as-usual concept leading to non-adoption and limited understanding of what E-government is all about and the potential benefits for its adoption (Al-Omari & Al-Omari, 2006; Sameer, Dwivedi, & Sherry, 2013).

Proactive measures need to be put in place to generate greater demand and acceptance of E-government if it should succeed since the development and wider acceptability of E-government would require marketing and awareness creation of the E-government stakeholders (Reffat, 2003; Venkatesh & Davis, 1996; Venkatesh et al, 2003).

Stakeholders could not be treated as a homogenous group to warrant the use of national averages as an assessment for their readiness to adopt E-government. Their readiness therefore, depends on a variety of factors such as awareness, technology accessibility, culture and economic status among others (Fedorowicz, Gogan, & Culnan, 2010). A stakeholder who is informed of the importance of E-government and is prepared to utilize it is a prerequisite for a wider participation and adoption of e-government (Choudrie, Weerakkody, & Jones, 2005). An initial assessment of this enables the diffusing institution to fashion out how to get stakeholder participation to ensure success (Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

Stakeholder awareness has been highlighted as one of the most important indicators in various Economic Intelligent Unit assessment such as well as the consumer and business adoption studies (EIU,2009; APEC, 2000; GeoSINC, 2002; ITU, 2012), the absence of which has resulted in under-utilisation of E-government services leading to failure (Weerakkody et al, 2007).

6.12.3 Capacity for Utilization

Access to technological infrastructural services provides a good starting point for stakeholder utilization of E-government but does not actually facilitate usage. It is rather essential to assess the stakeholders' capacity to utilize E-governance in the form of ICT skills and literacy among others (CTO, 2008). E-government targets all beneficiaries of public administration

(Gebba & Zakaria, 2012) and some of these beneficiaries could be handicapped in adopting E-government due to various factors such as physical, economic, geographical and cultural factors (Beig, Montazer, & Ghavamifar, 2007).

Lack of homogeneity of stakeholders makes the use of national averages assigned as a score of how ready they are in adopting E-government misleading. There are differences in local conditions with regard to local priorities, level of general economic and technology development among others (Evans & Yen, 2005). Each E-government project has targeted users and as such it is this target group that needs to be assessed for their capacity for utilizing such services. Among the factors that contribute to stakeholder capacity for utilization are the levels of literacy of individual beneficiaries of the E-government program (Zhu et al, 2006), appreciation and use of technologies among individuals and within businesses and other group of stakeholders and the usability and the type of technologies to be deployed (Ojo, Janowski, & Shareef, 2009).

E-government deployment is thus not only constrained by institutional or government capacity to diffuse but also stakeholders' ability to adopt and domesticate (Venkatesh & Davis, 2000)(Zhao, 2011). Hence, for successful implementation of E-government especially in developing countries, there is the urgent need to assess the capacity for utilization to ensure the broadest ability for the targeted stakeholders to benefit from E-government services and resources (Kassahun, Molla, & Sarkar, 2011; Bertot, Jaeger, & Grimes, 2010).

Various studies provide evidence of countries with a high human capital index and a high number of frequent internet users having a higher propensity to adopt E-government and rank higher in E-government rankings (Grönlund, 2005). However, since the national average of these indicators might be different from region to region, it is important that the assessment is done among the actual potential beneficiaries of E-government (Lee, Chang, & Berry, 2011; Azab, Kamel, & Dafo, 2009).

6.12.4 Socio-Political Culture

While the motivation for E-government deployment varies, it is an undeniable fact that it could be provided as a potent tool for the improvement of internal and service delivery effectiveness of government (Parent, Vandebeek, & Gemino, 2004) while enhancing public participation in governance (Caldow, 2004). E-government promotes e-participation through various channels such as e-mail or online comment forms as well as provision of feedback to stakeholders. The emergence of the social media now provides unprecedented opportunities for open, transparent and participatory governance (Zhao, 2011). However, the success of this

is predicated on the political and socio-cultural state of stakeholders of the government (Boateng et al, 2011).

Culture refers to the accepted norms and behaviors of a particular group of people. Culture may thus influence stakeholder expectation, preferences, experiences and their attitudes toward E-government (Kovačić, 2011; Weerakkody, El-Haddadeh, & Al-Shafi, 2011).

Adopting E-government innovation could present a conflicting attitude against the culture of a section of the stakeholders (Schaupp & Carter, 2010). For instance, countries with strong adherence to groups may not be enthused about E-government adoption whereas individualistic societies with the freedom to express their views are inclined to adopt E-government (Zhao, 2011; Choudrie, Umeoji, & Forson 2012).

Countries with a patriarchal culture and social structures which emphasize respect for authority create a difficult environment to diffuse E-government (Parent, Vandebeek, & Gemino, 2004; Imran & Gregor, 2010) just as countries with little trust in their government and public services would be reluctant to embrace E-government (Kolsaker & Lee-Kelley, 2008; Toland, 2011).

In developing countries, experience of government services and inactions of public servants blamed on "computers" would affect their inclination towards E-governance adoption (Laven, 2007). Many cultures with stronger preference for human contact and lower literacy rate tend to be reluctant to adopt E-government (Gauld, Goldfinch, & Horsburgh, 2010).

In such communities, however, social networks play a crucial role for E-government acceptance especially when a family member, a friend, member or an opinion leader of the community expresses a perception about it (Ali, Weerakkody, & El-Haddadeh, 2009) as espoused in the diffusion of innovation theory (Rogers, 2003). A more democratic political system and public policies that promote the diffusion of ICTs are associated with improved e-participation capabilities (Horsburgh, Goldfinch, & Gauld, 2011; Gulati, Yates, & Williams, 2012).

6.13 Computing the E-readiness of a Diffusing Institution

The proposed E-readiness assessment model adopts an institutional approach in determining the E-readiness for E-government diffusion in the local government system as a tool for decentralization. Since it is not meant for ranking or comparison, all predicting variables for the major constructs are assessed from 0 to 5. A score of 0 indicates the absence of a variable and the maximum score of 5 indicating perfect state. The mean score for the predictor variables provides the status of a major construct as being ready or otherwise. The aggregate

score for a major construct would inform the implementing authority or department the measures needed to be put in place for successful implementation of E-government as a tool for decentralization.

The predictor variables included in the metrics were chosen to present fair possible views on the construct they measure. The questionnaire should be administered by the government institutions to assess the actual E-readiness in the district or local government area and among the targeted stakeholders.

There are differences in culture and the level of development within the same country as well as in the stakeholders of the various strands of E-government. Using data made up of national average figures for E-readiness assessment might distort the findings particularly at the local government level. This model is being proposed using Ghana as a case study. However, other countries could replicate the methodology to determine an E-readiness index suitable for their local government levels.

CHAPTER 7

7   DATA ANALYSIS: VALIDATION OF THE PROPOSED TOPS MODEL

7.1   Introduction

This chapter provides detailed quantitative analysis used to validate the E-readiness Assessment model proposed for use in the study. It involves the validation of the major constructs, often referred to in the text as Criterion Variables, and their predictor variables of the conceptual model proposed in the previous chapter for the assessment of E-readiness of institutions for E-government diffusion. The validation process involves statistical tests for reliability and validity of the various constructs used and the relationships between these constructs and the outcome they seek to measure, that is E-readiness. The statistical validation of the model was done using Statistical Package for Social Scientists (SPSS). The resultant model is diagrammatically presented at the end of the chapter. This model is employed in the next chapter to empirically assess E-readiness of government institutions to deploy E-government in Ghana.

7.2   Validation of the Conceptual Model for the Assessment of E-readiness

The quantitative phase of this research involves validating the Technological, Organizational, Political and Stakeholder (TOPS) model for E-readiness assessment. The validated model is then used for the assessment of E-readiness of the decentralized institutions to diffuse E-government.

To validate the model as a useful tool for assessing E-readiness of the ministries, departments and agencies to diffuse E-government, 60 Chief Information Officers (CIO) were surveyed through an online questionnaire powered by Google Docs. The sampled CIOs were required to rate the major constructs and their predictor variables which have been identified from relevant literature and the supporting theories on a five point Likert scale as to their impact on the successful diffusion of E-government in their organizations. Forty (40) of the CIOs were drawn from public sector institutions while twenty (20) of them were drawn from quasi-state institutions that have strong relationships with the government as well as decentralised departments and agencies in various local government areas. The study used purposeful sampling to administer the questionnaire to the CIOs due to the specialization required in the field of information systems implementation and practical experience of public sector service delivery. Some of the CIOs were participating in an E-government capacity building

workshop where they were identified for the study.

7.3 Assignment of Weight and the Validation of the Main Constructs

The major constructs identified in the conceptual model are Technological Readiness, Organizational Readiness, Political Readiness and Stakeholder Readiness (TOPS) which all together would determine the state of E-readiness of a public institution to diffuse E-government. A pre-test was conducted to validate the questionnaire to be used for the survey. Feedback about the layout of the questionnaire and question ambiguity was obtained. Some changes were then made to the questionnaires as deemed appropriate. For instance, some of the predictor variables of the major construct (TOPS) were seen as duplication and were removed.

One of the common ways of assigning weight to constructs is to use expert opinion (Tarantola et al, 2006), hence the Chief Information Officers (CIOs) of government institutions throughout Ghana were used in the validation of the proposed model. The CIOs were asked to rate the impact of the main constructs on E-readiness for E-government implementation from their institutions' perspective. The respondents (CIOs) were then asked to rate the importance of the predictor variables to the main constructs that could determine the state of E-readiness of their institutions to diffuse E-government. The data obtained from their responses were analysed using SPSS.

Table 7-1 below provides a summary of the characteristics of the sample and instruments used in the validation process.

Table 7-1: Sample Characteristics

Characteristics	Details	Comments
Targeted population	CIOs	Chief Information officers
Targeted sample size	60	Drawn from public sector (40) and Quasi-state institutions (20)
Responses received	44	(73.33%) Significant
Constructs Measured	4	Technology, Organization, Political, Stakeholder
Likert Scale	0-5	0 = none, 1= very low, 2=low,3= average, 4= high 5= very high
Medium of Survey	Online	Utilized Google Drive
Sample Method	Purposeful	CIO on E-government capacity workshop

7.4 The Importance of Validating the E-readiness Assessment Model

Validating a measurement instrument is essential for its replication in information systems research. Validating constructs of a model as a primary process in empirical research in information systems research has attracted a lot of attention over the years (Straub, 1989). Continued advances in technological as well as theoretical research might require the same level of validation as empirical researches which have been dominant in information systems research (Sundaravej, 2010). The empirical validation of the TOPS model for E-readiness assessment therefore is to ensure its reproducibility (Drummond, 2009) and replicability (Tsang & Kwan., 1999).

7.5 Validation of the Major Constructs using Descriptive Analysis

The table (7-2) below presents the analysis of responses received from the Chief Information Officers (CIOs) rating the importance or the impact that the major constructs of the model, Technological, Organizational, Political and Stakeholder readiness have on E-readiness in their institutions.

The analysis of the responses shows very high mean scores. Political readiness is ranked highest as impacting on E-readiness followed by Technological readiness, institutional readiness and stakeholder readiness respectively. The responses also have low standard deviation indicating the responses gravitate around the mean with low variance. The respondents thus rated political readiness as having a higher impact on their institutions' E-readiness than technological readiness. Generally, the respondents regard all the major constructs as having strong influence on the E-readiness with stakeholder readiness regarded as the least influential.

Table 7-2: Descriptive Stastistics of the Criterion ER and its Variables

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
T	44	1.00	5.00	3.7273	1.04244
O	44	1.00	5.00	3.6818	1.17677
P	44	1.00	5.00	3.7955	1.13259
S	44	1.00	5.00	3.3864	1.26152
ER	44	6.00	20.00	14.5909	3.59145
Valid N (listwise)	44				

Source: Research Survey, 2012

7.6 Criterion Reliability with Cronbach's Alpha and Inter-Item Correlation Matrix

Criterion reliability measures the extent to which the selected variables measure what they purport to measure (Straub, Boudreau, & Gefen, 2004). To test the reliability of the constructs in the TOPS model as measuring E-readiness for E-government diffusion, Cronbach's Alpha and Inter-Item Correlation Matrix were used to test the reliability of the major constructs (Hourali et al, 2008) Constructs measuring the same outcome have a higher co-efficient among themselves with Cronbach's Alpha co-efficient of .70 and above considered considered higly significant and therefore, reliable measure of the outcome (Pallant, 2005; Sundaravej, 2010).

Table 7-3 below presents high Cronbach's Alpha co-efficient of the major constructs with coefficients above .8 and are therefore considered significant (Sundaravej, 2010). Technology has coefficient of .821, Organization, .845, Political, .861 and Stakeholder with .830. This indicates that the major constructs could reliably be used to measure E-readiness from the expert opinion of the CIOs surveyed.

Table 7-3: Cronbach's Alpha of the Constructs for Internal Factor Reliability

Model Construct	Reliability Statistics		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
Technology	.821	.821	5
Organization	.845	.850	5
Political	.861	.861	5
Stakeholder	.825	.830	5
ER	.808	.881	5

To further ensure the external factor reliability of the constructs of the E-readiness assessment model, the Inter-Item correlation matrix was used. Inter-item correlation matrix is an indication of a self-determining relationship between constructs measuring the same outcome, in this case the E-readiness. Positive correlations among constructs are an indication that an increase in the value of one construct could result in increases in the values of other variables as well as the outcome they measure (Straub, Boudreau, & Gefen, 2004).

The analysis of the responses from the CIOs confirms a strong relationship between the major constructs as indicated by the correlation among these constructs in the inter-item correlation matrix presented in table 7-4 below. The significantly high inter-item correlation matrix among the major constructs of the TOPS model is an indication that the constructs are highly related and could therefore be reliable measures for E-readiness. Evidently the correlation

between the constructs; T = .765, O= .772, P=.808, S=.770 and the resultant ER that they measure is significantly higher and therefore their reliability as measuring the E-readiness is very high.

Table 7-4: Inter-item Correlation Matrix

Inter-Item Correlation Matrix					
	T	O	P	S	ER
T	1.000	.402	.582	.453	.765
O	.402	1.000	.526	.461	.772
P	.582	.526	1.000	.431	.808
S	.453	.461	.431	1.000	.770
ER	.765	.772	.808	.770	1.000

7.7 Factor Analysis for Convergent and Discriminant Validity

Factor analysis was used to assess the validity of the main constructs used in the E-readiness assessment model. Factor analysis can be used to prove both convergence and discriminant validity (Greasley, 2008). The convergent validity of the variables are determined by the high and significant correlation among the group of predictor variables measuring the same construct while the discriminant validity is indicated by the low and insignificant correlation of the predictor variables that are not measuring a particular construct. Factor analysis has many other uses among which are defining relationships, identifying causal nexuses, clustering variables into a homogenous set allowing insight into the categories (Sharma, 2008; Pallant, 2005). The factor analysis for the validity tests was executed by an exploratory principal-components analysis (PCA) on the correlation matrix of the twenty (20) predictor variables for the four (4) main constructs with orthogonal rotation using the varimax procedure in SPSS 19 (Spinhoven et al, 1997).

Table 7-5 below presents the convergent and discriminant validity of the constructs and their predictor variables used in the proposed E-readiness assessment model. Predictor variables measuring the same construct are highly and significantly correlated and are highlighted indicating convergent validity of those predictor variables. All predictor variables for Technology readiness (T1-T5) have high correlation coefficients with lower correlation co-efficient for the other predictor variables. The same can be said of the predictor variables for Organizational (O1-O5), Political (P1-P5) and Stakeholder (S1-S5). These are indications that the predictor variables could validly be used to measure the same construct (Straub, 1989).

Table 7-5: Factor Analysis using VARIMAX rotation

	Rotated Component Matrix[a]			
	Component			
	1	2	3	4
T1	.049	-.198	-.191	**.747**
T2	.178	-.261	-.034	**.712**
T3	.098	.038	.080	**.811**
T4	.417	.109	-.141	**.586**
T5	.179	.065	.028	**.836**
O1	**.737**	.087	-.138	.146
O2	**.768**	.053	.168	.138
O3	**.780**	-.018	-.055	.242
O4	**.715**	.132	-.068	.183
O5	**.800**	.250	-.029	.021
P1	.325	**.608**	-.041	-.212
P2	.163	**.803**	.005	-.143
P3	.089	**.811**	.196	-.060
P4	-.028	**.814**	.091	.148
P5	.066	**.866**	.197	-.025
S1	.393	-.059	**.598**	-.065
S2	-.137	.050	**.771**	.073
S3	-.168	.189	**.853**	.070
S4	.058	.185	**.766**	-.129
S5	-.083	.066	**.818**	-.139
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

7.8 Regression Analysis for Validity Tests

Regression analysis is used to analyse the relation between two continuous variables. It is also suitable for studying functional dependencies between factors. This implies that a variable (X) either determines or partially determines the level of variable (Y) (Greasley, 2008). A regression co-efficient determines the direction of the relationship between two or more variables and ranges from -1 to 1. Regression coefficient of 1 denotes perfect positive correlation, -1 meaning perfect negative correlation while 0 correlation means the two variables are not related at a statistically significant confidence level (Bui, Sankaran, & Sebastian, 2003; Tarantola, Nardo et al, 2006). A non-zero coefficient means there is some extent of relationship but the impact of the change of one cannot be estimated with certainty and a coefficient with p-value > .05 is rejected or ignored (Sharma, 2008).

Table 7-6 below presents the regression coefficients of the major constructs of the proposed model and E-readiness. The table shows correlation between the independent variables which are the major constructs of the proposed model, namely technological readiness, organisational readiness, political readiness and stakeholder readiness, and the dependent variable E-readiness. The analysis shows statistically significant relationship between the variables TOPS and ER. T has β = .290, O, β = .328, P, β =.315 and S has the highest regression coefficient of β =.351 all at p-value <.001 significant levels at a confident interval of 99%. This shows that an improvement in any of the major constructs would positively affect E-readiness whilst a reduction in the value a major construct would negatively affect E-readiness.

Table 7-6: Regression table for the criterion variables

Coefficients[a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**99.0% Confidence Interval for B**	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1.332E-015	.000		.000	1.000	.000	.000
	T	1.000	.000	.290	126552963.753	.000	1.000	1.000
	O	1.000	.000	.328	148057365.528	.000	1.000	1.000
	P	1.000	.000	.315	130992463.357	.000	1.000	1.000
	S	1.000	.000	.351	163409925.833	.000	1.000	1.000
a. Dependent Variable: ER								

7.9 Validity Tests: Correlation Analysis

Having determined the existence of a relationship between the major constructs of the TOPS model and E-readiness, a correlation analysis was done to determine the degree and the directions of relationship between the four variables, TOPS and E-readiness. Correlation analysis provides information about the direction and strength of the relationship between two variables. A correlation coefficient above .6 with p-value < 01 is considered statistically significant (Greasley, 2008).

Table 7-7 below shows a statistically significant correlation between E-readiness (ER) and the variables of the proposed E-readiness assessment model (TOPS) at both p-values < .01. The correlation coefficient for T to ER is .698, O to ER is .838, P to ER is .789 and S to ER is .712. This proves that the criterion variables, Technological, Organizational, Political and Stakeholder readiness could measure the state of E-readiness (ER) of an institution for the diffusion of E-government. It is interesting to note that there is also a significant correlation

between P and all the other variables, an indication that P has significant effect on all the other variables in the proposed model. Thus an improvement in Political Readiness could lead the Organizational, Technological and Stakeholder Readiness for E-government diffusion.

Table 7-7:Correlation Analysis

Correlations			T	O	P	S	ER
Spearman's rho	T	Correlation Coefficient	1.000	.396**	.528**	.379*	**.698****
		Sig. (2-tailed)	.	.008	.000	.011	.000
		N	44	44	44	44	44
	O	Correlation Coefficient	.396**	1.000	.562**	.479**	**.838****
		Sig. (2-tailed)	.008	.	.000	.001	.000
		N	44	44	44	44	44
	P	Correlation Coefficient	.528**	.562**	1.000	.405**	**.789****
		Sig. (2-tailed)	.000	.000	.	.006	.000
		N	44	44	44	44	44
	S	Correlation Coefficient	.379*	.479**	.405**	1.000	**.712****
		Sig. (2-tailed)	.011	.001	.006	.	.000
		N	44	44	44	44	44
	ER	Correlation Coefficient	**.698****	**.838****	**.789****	**.712****	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.
		N	44	44	44	44	44
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Figure 7-1 below presents the criterion variables and their relationship with the outcome they measure. The relationship shows the correlation coefficients of Technological, Organizational, Political and Stakeholder readiness to E-readiness.
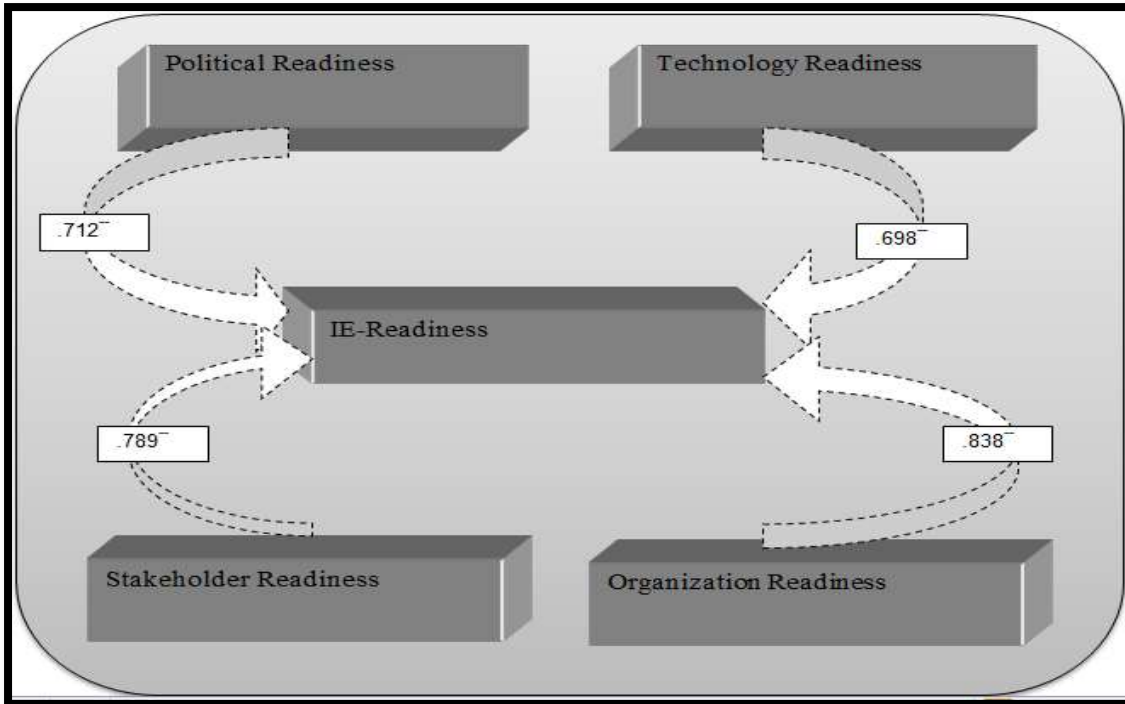
Figure 7-1: The TOPS Model Criterion Variables with their correlation coefficients

7.10 Empirical Validation of TOPS predictor variables

The various predictor variables of the main constructs of the TOPS Model were also subjected to the same process of validation to ensure the validity and replicability of the final model. To do this, an initial 20 predictor variables were identified from the literature and supported by the theories used as predicting the four (4) main constructs of the E-readiness model. The CIOs were required to rate these variables and suggest other variables that would impact on the 4 main constructs. These 20 predictor variables were made up of 6 predictor variables for Technological readiness; Organizational readiness had 5 predictor variables as well as Political readiness whilst stakeholder readiness had 4 predictor variables.

After a pre-test analysis and further discussions with the subject area experts, The (CIOs), the predictor variables were harmonised into five (5) predictor variables for each of the four (4) main constructs.

Table 7-8 below presents the main constructs and their respective predictor variables.

Table 7-8: Main Constructs with their Predictor Variables

Criterion Construct	Predictor Variables	Code
Technological Readiness (TR)	Availability of Telecommunication Networks (fixed/wireless)	T1
	Access and Quality of Internet Connectivity	T2
	Web presence (Existence of Website/Email)	T3
	Level of Automation	T4
	Expertise and Technical Support Staff	T5
Organization Readiness (OR)	Administrative Competence	O1
	E-Leadership	O2
	Organizational Awareness and Culture	O3
	E-Strategy	O4
	Budget and Resource Allocation	O5
Political Readiness (PR)	National Resource Allocation	P1
	National E-Leadership	P2
	National E-Strategy	P3
	Legal and Regulatory Framework	P4
	Institutional Framework	P5
Stakeholder Readiness (SR)	Access to Telephone	S1
	Access to Internet	S2
	Stakeholder Awareness	S3
	Capacity for Utilization	S4
	Socio-Political Culture	S5

7.11 Descriptive Analysis of the Variables

The CIOs sampled were required to rate the impact of each predictor variable on the corresponding main constructs on a zero (0) to five (5) Likert scale with 0 meaning no impact at all and 5 being the highest impact. The results of the questionnaire were analysed using SPSS software.

Table 7-9: Descriptive Stastistic for the predictor variables

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
T1	44	1.00	5.00	3.7273	1.08614
T2	44	2.00	5.00	3.8864	.86846
T3	44	2.00	5.00	4.0909	1.05253
T4	44	1.00	5.00	3.6364	1.24061
T5	44	2.00	5.00	3.6364	1.01365
TR	44	10.00	25.00	18.9773	4.04330
O1	44	2.00	5.00	3.7045	1.11187
O2	44	1.00	5.00	3.8636	1.04750
O3	44	2.00	5.00	3.8182	1.06253
O4	44	1.00	5.00	3.6591	1.14004
O5	44	2.00	5.00	3.8409	1.07710
OR	44	13.00	35.00	26.6364	6.01584
P1	44	2.00	5.00	3.5909	1.12721
P2	44	1.00	5.00	3.6136	1.27982
P3	44	1.00	5.00	3.5455	1.19016
P4	44	1.00	5.00	3.3864	1.46614
P5	44	1.00	5.00	3.3864	1.41776
PR	44	8.00	25.00	17.5227	5.22289
S1	44	1.00	5.00	3.6591	1.03302
S2	44	2.00	5.00	3.8409	.88772
S3	44	2.00	5.00	3.8864	.89484
S4	44	2.00	5.00	3.8864	.92046
S5	44	1.00	5.00	3.5227	1.06724
SR	44	11.00	24.00	18.7955	3.69525
Valid N (listwise)	44				

Source: Research Survey, 2012

The table (7-9) above presents the minimum and maximum scores of each predictor variable as well as their mean score to determine their reliability in assessing the main constructs of the proposed E-readiness assessment model. The mean scores for all the variables are quite high with low standard deviations. All the mean scores of the predictor variables are above 3.3, an indication that the respondents view the predictor variables as reliably measuring their respective main constructs of the proposed E-readiness Assessment model.

7.12 Reliability Analysis of Variables with Cronbach's Alpha

Cronbach's Alpha and Inter-Item Correlation Matrix were calculated based on the responses from CIOs to determine the reliability of the predictor variables for measuring their

respective criterion variables (the main Constructs) of the proposed TOPS model (Straub, Boudreau, & Gefen, 2004; Hourali et al, 2008; Sundaravej, 2010).

The Cronbach's Alpha coefficients presented in Table 7-10 below indicate a high reliability of the predictor variables for measuring the main constructs, well above the statistically significant Cronbach's Alpha coefficient of .70 for reliability testing (Pallant, 2005). The variables for Technological Readiness, Organizational Readiness, Political Readiness, and Stakeholder Readiness have a Cronbach's Alpha coefficient of .821, .845, .861, and .830 respectively. This shows statistically significant reliability of the major constructs measuring E-readiness (Sundaravej, 2010).

Table 7-10: Cronbach's Alpha Criterion Variables of the Model

Constructs	Reliability Statistics		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Technology	**.821**	.821	5
Organization	**.845**	.850	5
Political	**.861**	.861	5
Stakeholder	**.825**	.830	5
E-readiness	**.772**	.847	24

7.13 Inter-item Correlation

The reliability of the predictor variables and the respective criterion variables they measure and the inter-item correlation among variables measuring same criterion are presented in the inter-item correlation matrix presented in table 7-11. *(See appendix IV)*. As indicated earlier, the inter-item correlation matrix provides evidence of a self-determining relationship between the constructs or variables under consideration (Straub, Boudreau, & Gefen, 2004).

The positive correlations are an indication that as the value one factor increases, the values of the variable they measure increase as well. The inter-item correlation between the variables and constructs they measure are highlighted indicating high correlations. This is an indication that the predictor variables used to assess the state of the respective criterion variable (the main constructs) of the proposed TOPS model are valid measures of those criterion variables.

7.14 Convergent and Discriminant Validity of predictor variables

To further ensure the validity of the predictor variables of the main constructs used in the TOPS model, factor analysis was employed which among others defines relationships of variables and cluster variables into a homogenous set allowing insight into their categories (Gefen & Straub, 2005; Sharma, 2008). The rotated component matrix was used for the

purpose of simplifying the data and interpretation. To determine convergent validity, the variables measuring the same criterion variable (a main Construct of the Model) should converge on the same factor with higher rotated component coefficients than the factors that the variables are not supposed to measure (Spinhoven et al, 1997; Pallant, 2005).

Table 7-12 below provides evidence of the validity of the variables used for the assessment model. Variables measuring the same construct are highly and significantly correlated. The high coefficient among the predictor variables measuring the same criterion variable in the model provides further evidence of converging validity for the variables used in the proposed model. The table also confirms discriminant validity of the predictor variables with low correlations between the variables and the factors they do not measure.

Table 7-11: Factor Analysis using VARIMAX rotation

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
T1	.049	-.198	-.191	.747
T2	.178	-.261	-.034	.712
T3	.098	.038	.080	.811
T4	.417	.109	-.141	.586
T5	.179	.065	.028	.836
O1	.737	.087	-.138	.146
O2	.768	.053	.168	.138
O3	.780	-.018	-.055	.242
O4	.715	.132	-.068	.183
O5	.800	.250	-.029	.021
P1	.325	.608	-.041	-.212
P2	.163	.803	.005	-.143
P3	.089	.811	.196	-.060
P4	-.028	.814	.091	.148
P5	.066	.866	.197	-.025
S1	.393	-.059	.598	-.065
S2	-.137	.050	.771	.073
S3	-.168	.189	.853	.070
S4	.058	.185	.766	-.129
S5	-.083	.066	.818	-.139
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

7.15 Validity Analysis with Multiple Regression

Regression is a statistical technique that allows for the prediction of someone's score on one variable on the basis of their scores on several other variables. It is also suitable for studying

functional dependencies between factors. This implies that a variable (X) either determines or partially determines the level of variable (Y) (Greasley, 2008). Regression co-efficient determines the extent of relationship between the criterion variable and predictor variables. Regression coefficient of 1 denotes perfect positive correlation, -1 meaning perfect negative correlation while 0 correlation means the two variables are not related in any way (Bui, Sankaran, & Sebastian, 2003; Tarantola et al, 2006).

A non-zero coefficient means there is some extent of relationship but the impact of the change of one cannot be estimated with certainty and a coefficient with p-value> .05 is rejected or ignored (Sharma, 2008). The R^2 value also measures how well the model explains the data. Differences between observations that are not explained by the model remain in the error term. The R^2 value thus provides a gauge of the percentage of those differences that are explained by the model they are measured between 0 and 1 in SPSS (Pallant, 2005).

Table 7-13 below presents the regression coefficients of the variables indicating significant correlation between the independent variables and the dependent variable. The Standardized Beta Coefficients give a measure of the contribution of each variable to the model. There is a statistically significant relationship between the criterion variable (Technological Readiness (TR) and its predictor variables T1-T5 at p-value < 01. T1 has β= .269, T2 has β .215, T3 has β= .260, T4 has β .307and T5 with β .251 all at p-value< 01 with R^2=1.0. This indicates that the predictor variables T1-T5 can validly be used to measure the state of the criterion variable Technological Readiness (TR) in the proposed E-readiness assessment model.

Table 7-12: Regression coefficient of criterion variable (T) with predictor variables

Coefficients[a]							
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-7.105E-015	.000		.	.	.000	.000
	T1	1.000	.000	.269	.	.	1.000	1.000
	T2	1.000	.000	.215	.	.	1.000	1.000
	T3	1.000	.000	.260	.	.	1.000	1.000
	T4	1.000	.000	.307	.	.	1.000	1.000
	T5	1.000	.000	.251	.	.	1.000	1.000
a. Dependent Variable: TR								

Table 7-14 below presents the regression coefficients of the variables indicating correlation between the independent variables and the dependent variable. The Standardized Beta Coefficients give a measure of the contribution of each variable to the model. There is a statistically significant relationship between the criterion variable Organizational Readiness (OR) and the predictor variables O1-03 at p-value < 01.This indicates that the predictor variables O1-O3 can validly be used to measure the state of the criterion variable OR.O1 has β= .294, O2 has β .362, O3 has β= .373, However the significance of the two predictor variables O4 with β .095 at p-value > 05 and O5 with β =.075 at p-value > 05 are statistically low. However, their validity as a measure of OR is compensated for by the highly significant $R^2 = .945$ of the model as well as ANOVA of p-value < .001.

Table 7-13: Regression coefficient criterion variable (O) and its predictor variables

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.222	1.037		1.178	.246	-1.590	4.033
	O1	1.590	.271	.294	5.864	.000	.854	2.325
	O2	2.078	.295	.362	7.044	.000	1.278	2.877
	O3	2.112	.306	.373	6.906	.000	1.283	2.941
	O4	.499	.262	.095	1.910	.064	-.210	1.209
	O5	.419	.295	.075	1.420	.164	-.381	1.219
a. Dependent Variable: OR								

Table 7-15 below presents significant coefficients of the predictor variables of Political Readiness. The predictor variables (P1-P5) have statistically significant standardized coefficients of β=.216 for P1, β=.245 for P2, β=.228 for P3, β=.281 for P4 and of β=.271 for P5, all at p-value < .01. The $R^2 = 1.000$ and ANOVA of p-value < 01.

This provides an indication that the predictor variables (P1-P5) could validly be used to measure the criterion variable Political Readiness (PR) in the proposed E-readiness Model.

Table 7-14: Regression coefficients of (P) and its predictor variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.441E-016	.000		.000	1.000	.000	.000
	P1	1.000	.000	.216	137340577.912	.000	1.000	1.000
	P2	1.000	.000	.245	117823154.685	.000	1.000	1.000
	P3	1.000	.000	.228	117234198.316	.000	1.000	1.000
	P4	1.000	.000	.281	140400574.489	.000	1.000	1.000
	P5	1.000	.000	.271	108075324.108	.000	1.000	1.000
a. Dependent Variable: PR								

The table 7-16 below presents statically significant coefficients of the predictor variables (S1-S5) of Organizational Readiness (OR). The respective standardized coefficients of β=.280 for S1, β=.240 for S2,β=.242 for S3,β=.249 for S4 and of β=.289 for S5, all at p-value < .01. The R^2 = 1.000 and ANOVA of p-value < 01. These provide an indication that there is a statistically significant validity of the predictor variables (S1-S5) measuring the criterion variable, Stakeholder Readiness (SR).

Table 7-15: Regression coefficients of criterion variable (S and its predictor variables)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1.332E-015	.000		.	.	.000	.000
	S1	1.000	.000	.280	.	.	1.000	1.000
	S2	1.000	.000	.240	.	.	1.000	1.000
	S3	1.000	.000	.242	.	.	1.000	1.000
	S4	1.000	.000	.249	.	.	1.000	1.000
	S5	1.000	.000	.289	.	.	1.000	1.000
a. Dependent Variable: SR								

7.16 Validity Testing using Correlation Analysis

Correlation analyses as a statistical tool is employed in the determination of the direction and strength in the relationship between two variables. Having determined the existence of

relationship between the criterion variables T, O, P S and their respective predictor variables, it was important to undertake a correlation analysis to determine the degree and direction of the relationships identified among the criterion variables (Main Constructs of the Model) and their respective predictor variables. A correlation coefficient above .6 with p-value < 01 is considered statistically significant (Greasley, 2008).

7.16.1 Correlation for T and its Predictor Variables

The table 7-17 below shows a statistically significant positive correlation between Technology Readiness (TR) and its predictor variables T1,T2,T3,T4 And T5 all at both p-value < .01 and p-value <.05. This is an indication that an improvement in the predictor variables would result in an overall improvement in Technological Readiness.

Table 7-16: Correlation for T and Its Variables

Correlations			T1	T2	T3	T4	T5	TR
Spearman's rho	T1	Correlation Coefficient	1.000	.533**	.487**	.351*	.483**	.741**
		Sig. (2-tailed)	.	.000	.001	.020	.001	.000
		N	44	44	44	44	44	44
	T2	Correlation Coefficient	.533**	1.000	.476**	.404**	.443**	.722**
		Sig. (2-tailed)	.000	.	.001	.007	.003	.000
		N	44	44	44	44	44	44
	T3	Correlation Coefficient	.487**	.476**	1.000	.389**	.701**	.815**
		Sig. (2-tailed)	.001	.001	.	.009	.000	.000
		N	44	44	44	44	44	44
	T4	Correlation Coefficient	.351*	.404**	.389**	1.000	.532**	.705**
		Sig. (2-tailed)	.020	.007	.009	.	.000	.000
		N	44	44	44	44	44	44
	T5	Correlation Coefficient	.483**	.443**	.701**	.532**	1.000	.816**
		Sig. (2-tailed)	.001	.003	.000	.000	.	.000
		N	44	44	44	44	44	44
	TR	Correlation Coefficient	.741**	.722**	.815**	.705**	.816**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.
		N	44	44	44	44	44	44
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Table 7-17: Correlation of O and its Predictor Variables

			O1	O2	O3	O4	O5	OR
Correlations								
Spearman's rho	O1	Correlation Coefficient	1.000	.526[**]	.576[**]	.396[**]	.578[**]	**.817[**]**
		Sig. (2-tailed)	.	.000	.000	.008	.000	**.000**
		N	44	44	44	44	44	**44**
	O2	Correlation Coefficient	.526[**]	1.000	.583[**]	.602[**]	.521[**]	**.774[**]**
		Sig. (2-tailed)	.000	.	.000	.000	.000	**.000**
		N	44	44	44	44	44	**44**
	O3	Correlation Coefficient	.576[**]	.583[**]	1.000	.564[**]	.606[**]	**.810[**]**
		Sig. (2-tailed)	.000	.000	.	.000	.000	**.000**
		N	44	44	44	44	44	**44**
	O4	Correlation Coefficient	.396[**]	.602[**]	.564[**]	1.000	.519[**]	**.666[**]**
		Sig. (2-tailed)	.008	.000	.000	.	.000	**.000**
		N	44	44	44	44	44	**44**
	O5	Correlation Coefficient	.578[**]	.521[**]	.606[**]	.519[**]	1.000	**.688[**]**
		Sig. (2-tailed)	.000	.000	.000	.000	.	**.000**
		N	44	44	44	44	44	**44**
	OR	**Correlation Coefficient**	**.817[**]**	**.774[**]**	**.810[**]**	**.666[**]**	**.688[**]**	**1.000**
		Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	**.**
		N	**44**	**44**	**44**	**44**	**44**	**44**
**. Correlation is significant at the 0.01 level (2-tailed).								

7.16.2 Correlation of O and its Predictor Variables

Table 7-18 above shows a statistically significant positive correlation between Organizational Readiness (OR) and the predictor variables O1,O2,O3,O4 and O5 all at both p-value < .01 and p-value <.05 indicating that as the various predictor variables improve, there would be an improvement in the Organizational Readiness.

7.16.3 Correlation of P and its Predictor Variables

Table 7-19 below presents a statistically significant positive correlation between Political Readiness (PR) and the predictor variables P1,P2,P3,P4 And P5 all at both p-value < .01 and p-value <.05 as highlighted below in the table. This therefore means that as the predictor variables improve, there would be an improvement in the criterion variable (PR) of the E-readiness Assessment Model.

Table 7-18: Correlation of P and its Predictor Variables

			P1	P2	P3	P4	P5	**PR**
Spearman's rho	P1	Correlation Coefficient	1.000	.552**	.453**	.435**	.394**	**.605****
		Sig. (2-tailed)	.	.000	.002	.003	.008	**.000**
		N	44	44	44	44	44	**44**
	P2	Correlation Coefficient	.552**	1.000	.750**	.584**	.743**	**.837****
		Sig. (2-tailed)	.000	.	.000	.000	.000	**.000**
		N	44	44	44	44	44	**44**
	P3	Correlation Coefficient	.453**	.750**	1.000	.609**	.733**	**.841****
		Sig. (2-tailed)	.002	.000	.	.000	.000	**.000**
		N	44	44	44	44	44	**44**
	P4	Correlation Coefficient	.435**	.584**	.609**	1.000	.760**	**.845****
		Sig. (2-tailed)	.003	.000	.000	.	.000	**.000**
		N	44	44	44	44	44	**44**
	P5	Correlation Coefficient	.394**	.743**	.733**	.760**	1.000	**.909****
		Sig. (2-tailed)	.008	.000	.000	.000	.	**.000**
		N	44	44	44	44	44	**44**
	PR	**Correlation Coefficient**	**.605****	**.837****	**.841****	**.845****	**.909****	1.000
		Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	.
		N	44	44	44	44	44	44

Correlations

**. Correlation is significant at the 0.01 level (2-tailed).

7.16.4 Correlation of S and its Predictor Variables

Table 7-20 below shows a statistically significant positive correlation between Stakeholder Readiness (S) and the predictor variables S1,S2,S3,S4 and S5 all at both p-value < .01 and p-value <.05. This is an indication of a direct relationship between the predictor variables and the criterion variable Stakeholder Readiness (SR) of the proposed model.

Table7-19: Correlation of SR and its Variables

Correlations			S1	S2	S3	S4	S5	**SR**
Spearman's rho	S1	Correlation Coefficient	1.000	.431**	.416**	.350*	.361*	**.728****
		Sig. (2-tailed)	.	.004	.005	.020	.016	**.000**
		N	44	44	44	44	44	**44**
	S2	Correlation Coefficient	.431**	1.000	.620**	.394**	.490**	**.731****
		Sig. (2-tailed)	.004	.	.000	.008	.001	**.000**
		N	44	44	44	44	44	**44**
	S3	Correlation Coefficient	.416**	.620**	1.000	.621**	.548**	**.807****
		Sig. (2-tailed)	.005	.000	.	.000	.000	**.000**
		N	44	44	44	44	44	**44**
	S4	Correlation Coefficient	.350*	.394**	.621**	1.000	.668**	**.764****
		Sig. (2-tailed)	.020	.008	.000	.	.000	**.000**
		N	44	44	44	44	44	**44**
	S5	Correlation Coefficient	.361*	.490**	.548**	.668**	1.000	**.768****
		Sig. (2-tailed)	.016	.001	.000	.000	.	**.000**
		N	44	44	44	44	44	**44**
	SR	**Correlation Coefficient**	**.728****	**.731****	**.807****	**.764****	**.768****	1.000
		Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	.
		N	44	44	44	44	44	44
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

7.17 The Validated TOPS Model

This chapter set out to validate the conceptual TOPS model developed for the assessment of E-readiness for institutions and government departments for E-government diffusion. Using the correlation coefficient to indicate the extent and direction of the relationship between criterion variables and their predictor variables, the validated TOPS model for E-readiness assessment is presented below with the correlation coefficients of the criterion variables and their respective predictor variables.

Figure 7-2 below also presents the correlation between the criterion variables (the main constructs of the model) and the outcome they measure, E-readiness. The model does show that overall the E-readiness of an institution under consideration would improve if there are improvements in the identified variables; therefore the model could validly be used to assess E-readiness for E-government diffusion.
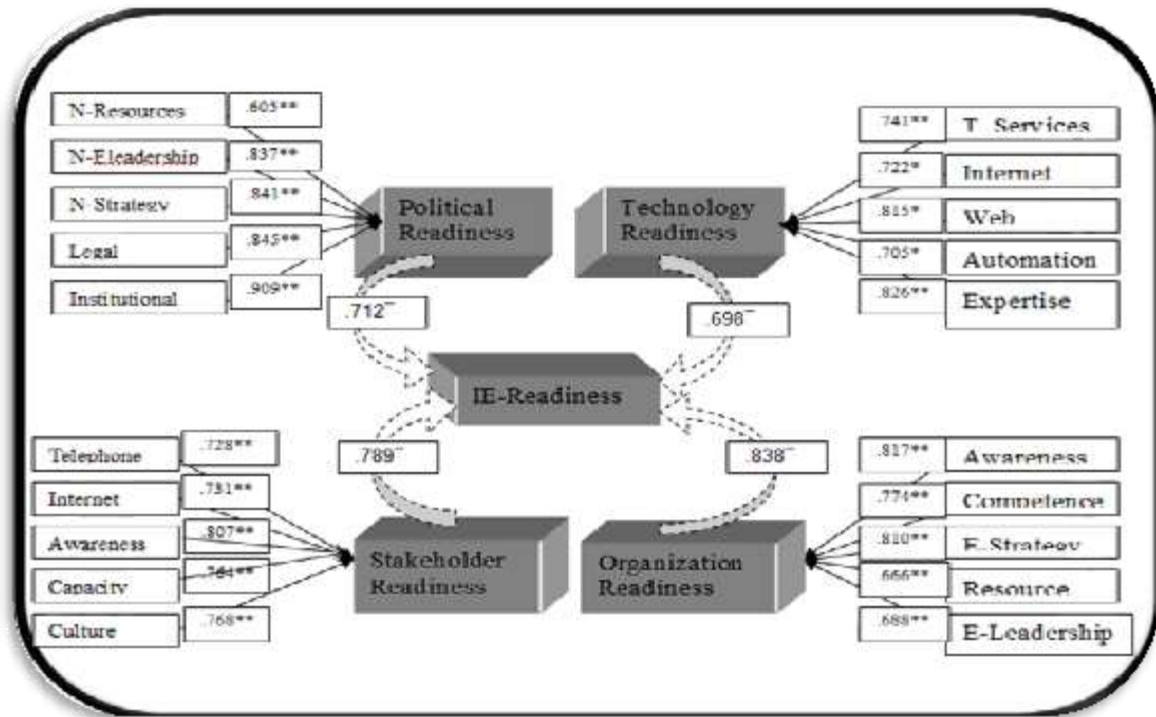
Figure 7-2: Validated TOPS Model with correlation coefficient

CHAPTER 8

8   THE EMPIRICAL APPLICATION OF THE TOPS MODEL

8.1   Introduction

Having proposed and validated an appropriate model for assessing E-readiness for e-government diffusion in the previous two chapters, this chapter provides answers to the research questions outlined in the introductory chapter of this study using both qualitative and quantitative data. The empirical applications of the TOPS E-readiness Assessment model are thus presented in this chapter.

It has been established that the successful diffusion of E-government for local governance requires that government institutions such as ministries, departments and agencies should be adapted for the diffusion of E-government programs (Homburg & Dijkshoorn, 2010). Using the Technological, Organizational, Political and Stakeholder (TOPS) model, this chapter assesses the E-readiness of the local government institutions to diffuse and institutionalize E-government in Ghana. To determine the state of E-readiness of local government institutions for e-government diffusion, Quantitative data was collected from sixty three (63) local authorities, decentralized departments and agencies across 4 regions in Ghana for the assessment of their E-readiness.

To further identify the impact of E-governance on the decentralization process and determine the factors influencing E-readiness of these institutions to diffuse e-government, qualitative data was concurrently collected with the quantitative data through interviews, documents analysis and observations The analysis of these data are presented in this chapter.

8.2   Assessment of E-readiness of Local Authorities for E-government Diffusion

Diffusion of technological innovations especially in the developing countries is attracting the attention of both researchers and international organizations (Choudrie, Umeoji, & Forson, 2012). This research is aimed at identifying whether E-government can be used to bypass the rigid bureaucracies still existing in the developing countries to provide efficient and effective governance at the local government levels. Using E-government as a tool for decentralization means;

    i.   Citizens and other stakeholders should be able to access government services at their convenience without the need to travel to a district, regional or national office of the

ministry, department or agency providing the service referred to in this study as e-services (El-Haddadeh et al, 2013).

ii. Citizens are able to interact, contribute and take part in governance and legislative processes at their convenience electronically and expect a feedback (Chan et al, 2010). Citizens and public interest groups should be able to reach ministers, district chief executives, directors and members of parliament and receive feedback and make their voice heard without the need to travel to the regional or district capital referred to in this study as e-democracy (Caldow, 2004).

iii. Citizens and businesses should be able to transact business electronically without the current hassle of travelling thus avoiding the attendant influences and bribery (Bertot, Jaeger, & Grimes, 2010). Citizens and businesses should be able to pay for government services and vice versa referred to in this study as e-business (Batley & Larbi, 2004)

iv. That internal processes and the interaction with other government entities should be done electronically so as to enable citizens and stakeholders to obtain services effectively and efficiently, reducing redundancies and time required for service delivery referred to in this study as e-management (Bekkers & Homburg, 2005).

To assess the E-readiness of local government institutions, data was collected from districts, municipal, metropolitan assemblies and the decentralized ministries, departments and agencies offices within the metropolitan, municipal and district capitals. Various heads of department or their designated representatives were randomly sampled and served with paper-based questionnaire whilst an online questionnaire through emails was snowballed where officials were asked to forward the questionnaire to their colleagues in other local government areas and institutions. Table 8-1 below provides a description of the institutions that responded and are categorized into the levels and types of local government.

Table 8-1: Characteristics of the sample

Level of Gov't	No of Inst.	Departments/ Institutions Surveyed
Regional	10	Regional Admin, Education, Health, NCCE, Judicial Service,
Metropolitan	12	MAs, Birth and Death, Judicial Service
Municipal	18	MAs, Controller and Acct Gen. Commission for Human Rights
District	23	DAs, Fire Service, Education, Health, NCCE, Judicial Service,
Total	63	

Source: field work, 2012

Sixty three (63) responses were received of which 10 were from regional level institutions; 12 were from metropolitan areas, 18 from municipal areas and 23 from the district level. These are the institutions that provide a wide range of decentralized services including regional coordinating departments responsible for coordinating the activities of their respective departments in the metropolitan, municipal and districts.

8.3   The Taxonomy of Decentralized Government Services in Ghana

Government services delivery under the decentralization system in Ghana is a shared responsibility at the various levels of government. Unlike in other countries where designated services are solely provided by the local government and others designated for the national government, in Ghana, the services are shared with strong central government monitoring and control. Table 8-2 below provides the taxonomy of the decentralized government services. It describes the responsibilities at the various levels of government with regard to the provisioning of a specific public service.

Table 8-2: Taxonomy of Decentralized Government ServicesDecentralized Institutions and Services	Service Delivery Responsibility (")			
	Central Government	*Regional Administration*	*MMDA*	*Area Council*
Education	"	Coordinate	"	
Fire Service	"	Coordinate	"	
Police Service	"	Coordinate	"	
Judicial Services	"	Coordinate		
Statistical Services	"	Coordinate	"	
Birth and Death Registry	"	Coordinate	"	
Health Care Delivery	"	Coordinate	"	
Social Welfare	"	Coordinate	"	
Town and Country Planning	"	coordinate	"	
Environmental Protection	"	Coordinate	"	
Sports and Culture	"	Coordinate	"	
Parks and Gardens	"	Coordinate	"	
Water and Sanitation	"	Coordinate	"	
Economic Development	"	"	"	
Electoral Commission	"	Coordinate	"	
National Commission for Civic Education	"	Coordinate	"	

Adapted from (http://www.clgf.org.uk/userfiles/1/File/2008_Country_Files/GHANA.pdf)

The E-readiness of the local government institutions responsible for the delivery of public services at the local level in Ghana surveyed, listed in table 8-2 above were therefore assessed using the TOPS E-readiness Assessment model. The Technological Readiness (TR), Organizational Readiness (OR), Political Readiness (PR) and Stakeholder Readiness (SR) of the decentralized institutions to diffuse e-government were assessed based on the responses from the quantitative data collected from the 63 institutions surveyed. The individual predictor variables of criterion variables were assessed and summed up to indicate the state of the respective criterion variable.

8.4 The Assessment of Technological Readiness of the Institutions

The Technological Readiness (TR) assesses the level of access to and use of information and communication technologies in the organization presently. Organizations with a higher technological readiness are more likely to diffuse E-government faster and more easily than those with low technological readiness (Tornatzky & Fleischer, 1990).

The Technological Readiness (TR) was assessed using the predictor variables presented in table 8-3 below.

Table 8-3: Predictor Variables for Technological Readiness

Predictor Variables	Codes
Access to Telecommunication Networks	TA
Access and Quality of Internet Connectivity	AI
Web Presence	WP
Level of Automation	LA
Technical Expertise	TE
Technological Readiness	**TR**
Maximum Score for TR	**MS**

Table 8-4 below presents the analysis of the data to determine the state of Technological Readiness (TR) of the local government institutions surveyed. The results indicate that access to technological infrastructure and services (TA) has the highest mean score of 18 fuelled by access to mobiles connectivity and improving mobile services and mobile internet services.

Most of the institutions in the local government areas surveyed have access to mobile phone services. This is followed by the level of automation (LA) with web presence (WP) 5.1 and technical expertise (TE) 6.7 scoring very low. This is an indication that there is substantial access to telecommunication infrastructure and services among the respondents. However,

the lack of technical capabilities and low web presence are negatively affecting the level of technological readiness for e-government diffusion in the local government institutions.

Table 8-4: Descriptive Statistics for Technological Readiness

Statistics		LA	AI	TE	TA	WP	TR	MS
N	Valid	63	63	63	63	63	63	63
	Missing	0	0	0	0	0	0	0
Mean		10.6667	6.7619	8.6349	13.9841	5.1429	45.1905	105.0000
Median		10.0000	8.0000	9.0000	15.0000	3.0000	44.0000	105.0000
Minimum		.00	.00	.00	4.00	.00	15.00	105.00
Maximum		22.00	15.00	15.00	18.00	20.00	78.00	105.00
Percentiles	25	6.0000	.0000	7.0000	13.0000	1.0000	31.0000	105.0000
	50	10.0000	8.0000	9.0000	15.0000	3.0000	44.0000	105.0000
	75	16.0000	12.0000	11.0000	16.0000	10.0000	58.0000	105.0000

The level of each of the predictor variables is also presented graphically in figure 8-1 below and compares the individual variables of technological readiness to the expected maximum score. It shows considerably low technological readiness with a maximum score of 78 out of the expected score of 105 points whilst a minimum score of 15 was recorded among the respondents.
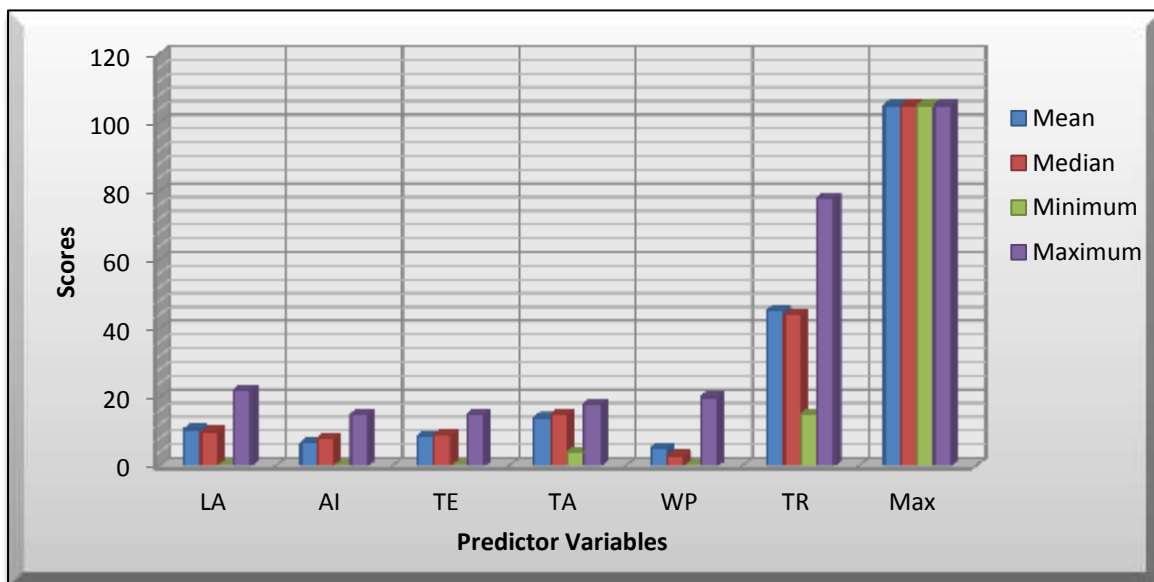
Figure 8-1: Technological Readiness of the Respondents

Figure 8-2 below is a histogram showing the distribution and the skewness of the Technological Readiness of the sample. The distribution shows negative Kurtosis indicating that technological readiness peaks before the mean score. This means that fewer local government institutions surveyed actually scored above the mean. The analysis therefore shows that a greater number of the institutions surveyed have low technological readiness for the diffusion of e-government.
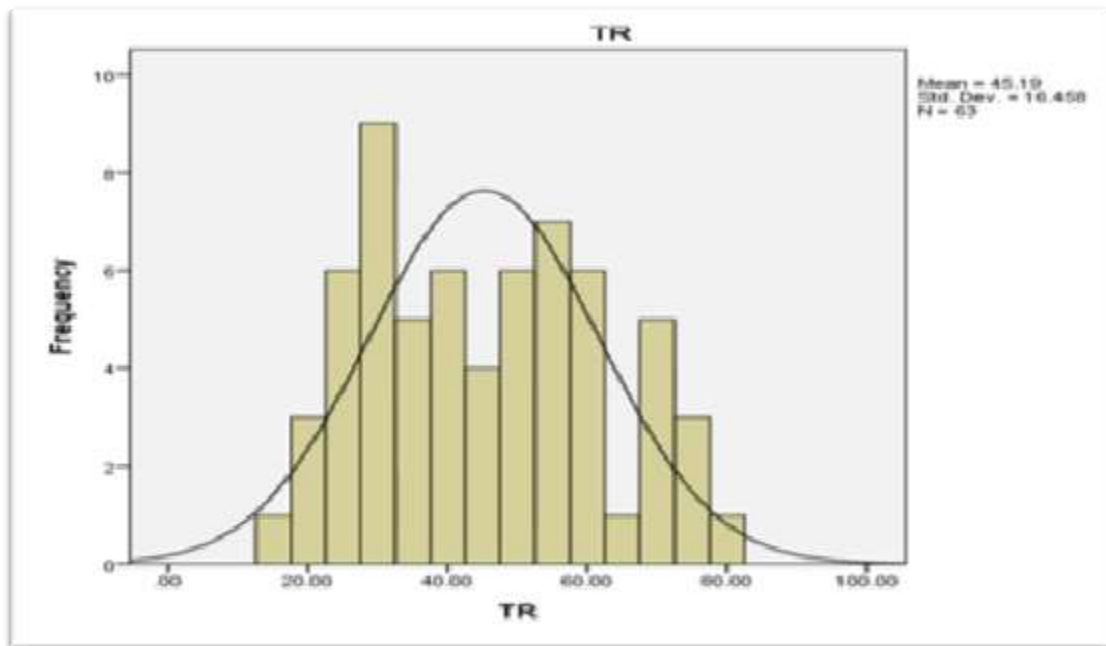
Figure 8-2: Distribution of Organizational Readiness

8.5   The Assessment of Organizational Readiness of the Institutions

Organizational Readiness (OR) measures the level of readiness of the government institution or department in these local government areas towards E-government diffusion. The readiness of the organization plays a critical role in successful innovation diffusion (Rogers, 2003). The Organizational Readiness (OR) uses five predictor variables as justified in the conceptual development and validation of the TOPS model. Table 8-5 below presents the predictor variables, the composite of which is used to determine the institutions' readiness for E-government diffusion

Table 8-5: Predictor Variables for Organizational Readiness

Predictor Variables	Codes
Organizational Awareness	A
Administrative Competence	C

Organizational E-Strategy	S
Budget and Resource Allocation	R
Organizational E-Leadership	L
Organizational Readiness	**OR**
Maximum Score	**MS**

The analysis of the data collected from the local government institutions sampled with regard to their organizational readiness is presented below in Table 8-6 and graphically in Figure 8-3. The result indicates a higher mean score for administrative competencies with 14.73. This is because entry qualifications for employment in most of the institutions are above college diploma.

The heads of the institutions surveyed consider their staff as qualified and competent for their jobs. Organization e-leadership had a mean score of 9.68 with organizational strategy and resources scoring low. This indicates that many of the respondent institutions are yet to put in place e-strategies and plans. There is therefore, low commitment of resources for E-government diffusion. The mean score for Organizational Readiness for the institutions surveyed is 50.95 out of 105 points scale.

Table 8-6: Descriptive Statistics for Organizational Readiness

Descriptive Statistics for Organizational Readiness		C	L	S	A	R	OR	MS
N	Valid	63	63	63	63	63	63	63
	Missing	0	0	0	0	0	0	0
Mean		14.7302	9.6825	7.8095	10.9048	7.8254	50.9524	105.0000
Median		14.0000	10.0000	8.0000	11.0000	7.0000	52.0000	105.0000
Minimum		8.00	2.00	.00	3.00	.00	19.00	105.00
Maximum		22.00	19.00	17.00	19.00	18.00	84.00	105.00
Percentiles	25	12.0000	5.0000	3.0000	8.0000	4.0000	33.0000	105.0000
	50	14.0000	10.0000	8.0000	11.0000	7.0000	52.0000	105.0000
	75	17.0000	13.0000	12.0000	14.0000	12.0000	66.0000	105.0000

Figure 8-3 below presents the score of Organizational Readiness of the institutions surveyed in terms of mean, median, maximum score and minimum score for all the predictor variables and the total and maximum score on the Organizational Readiness (OR) scale. It shows a low level of scores for all the predictor variables indicating a very low level of organizational readiness for the local government institutions surveyed for the diffusion of E-government.
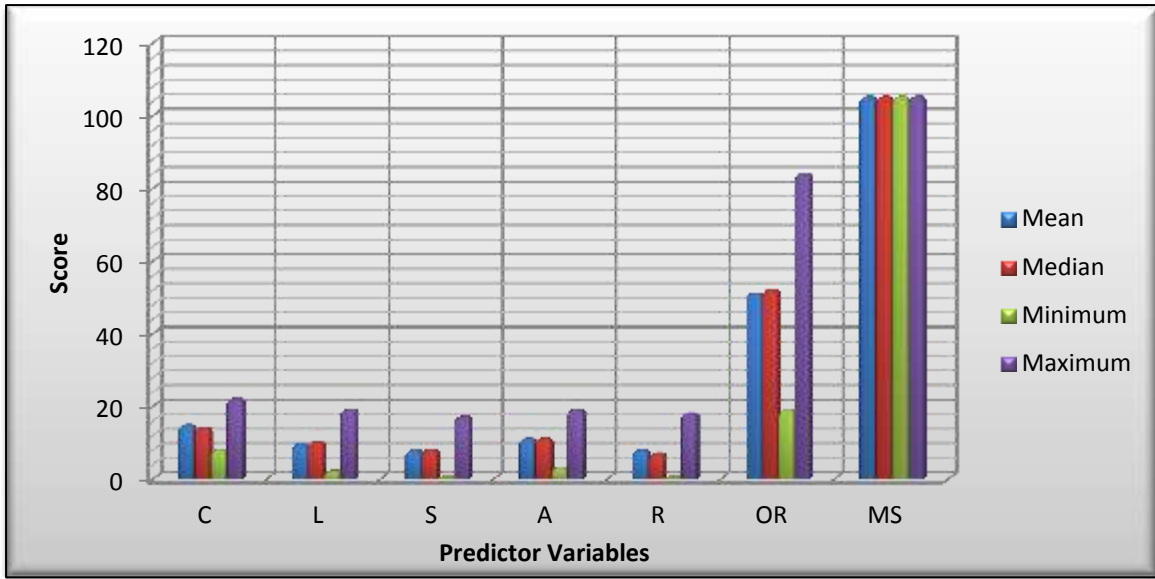
Figure 8-3: Organizational Readiness

The histogram below shows a negative Kurtosis for the distribution of organizational readiness. This is an indication of fewer organizations scoring above the mean and therefore a large number of the institutions surveyed have a low level of Organizational Readiness (OR). The analysis of the data shows the Organizational Readiness of the institutions is negatively affected by the absence of organizational e-strategy and resources allocation for E-government diffusion.
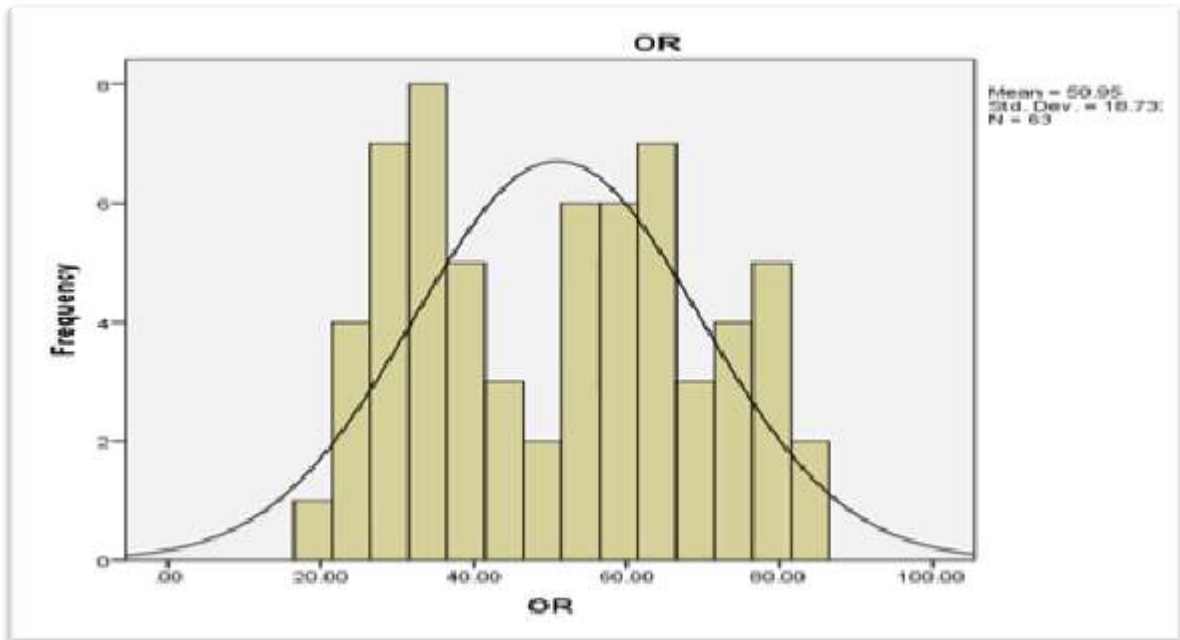
Figure 8-4: Distribution of Organizational Readiness

8.6 The Assessment of Political Readiness of the Institutions

Since the sample comprised government institutions involved in the public services provision, the political environment under which they operate contributes significantly to the successful diffusion of any innovation and E-government is not an exception (Tolbert, Mossberger, & McNeal, 2008; Ahn & Bretschneider, 2011).

As identified in the conceptual framework for the TOPS model, the source of innovation and its championing, significantly affect its diffusion (Tornatzky & Fleischer, 1990). This study therefore measured The Political Readiness (PR) by asking the institutions surveyed as to how the predictor variables presented in Table 8-7 are contributing to E-government diffusion in their institutions.

Table8-7: Predictor Variables for Political Readiness

Predictor Variables	Codes
National E-Strategy	NS
Legal/ Institutional Framework	NL
National Resource Allocation	NR
E-Leadership	NE
Political Readiness	**PR**
Maximum Score	**MS**

Table 8-8 presents the descriptive analysis of the data collected from the institutions. The mean score for the predictor variables of Political Readiness is 33.09 indicating low level of political readiness for the various decentralized institutions surveyed. Most of the institutions are not aware of the plans of the parent ministries and departments for E-government diffusion. The legal framework does not provide these institutions the avenue to develop their own E-government policies and strategies.

The mean scores for the variables range from 8.80 for National e-leadership to 7.92 for Legal framework for their organization to diffuse E-government. These scores indicate that the institutions surveyed view national e-leadership for e-government diffusion as very low and the legal and regulatory framework as having little impact on their readiness to adopt E-government.

Table8-8: Descriptive Analysis of Political Readiness

Statistics							
		NL	NR	NE	NS	PR	MS
N	Valid	63	63	63	63	63	63

	Missing	0	0	0	0	0	0
Mean		7.9206	8.0952	8.8095	8.2698	33.0952	80.0000
Median		8.0000	8.0000	9.0000	8.0000	31.0000	80.0000
Minimum		.00	.00	.00	.00	.00	80.00
Maximum		15.00	15.00	16.00	15.00	53.00	80.00
Percentiles	25	6.0000	5.0000	6.0000	6.0000	23.0000	80.0000
	50	8.0000	8.0000	9.0000	8.0000	31.0000	80.0000
	75	11.0000	12.0000	11.0000	11.0000	44.0000	80.0000

Figure 8-5 is a graphical presentation of the comparison of the mean, median, minimum and maximum scores of the predictor variables of political readiness. The maximum score for political readiness among the institutions surveyed was 53.00 and the minimum score was 0. The mean total score of about 40 on a scale of 105 indicates a very low level of Political Readiness (PR) of the institutions surveyed.
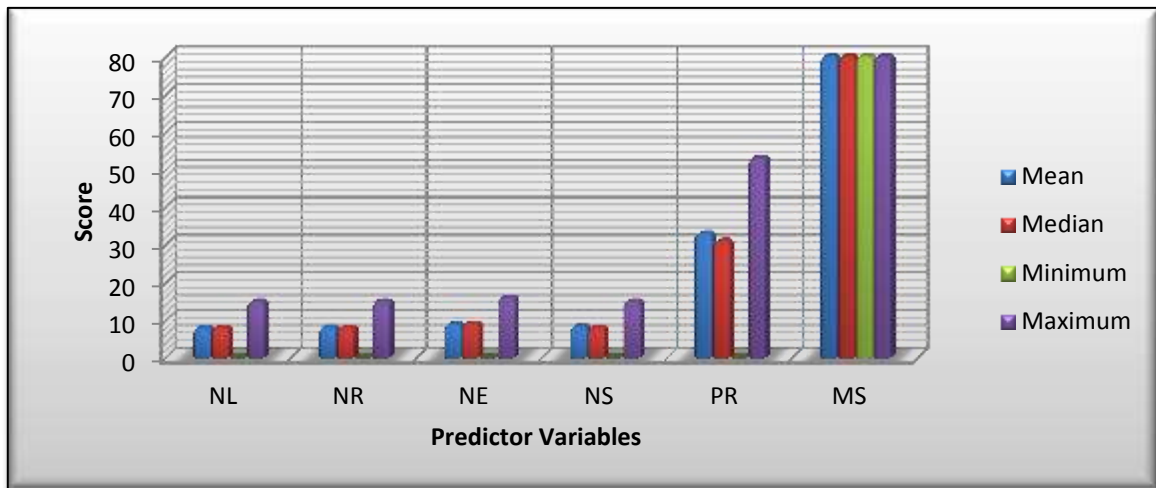
Figure 8-5: Graphical Presentation of Political Readiness Score
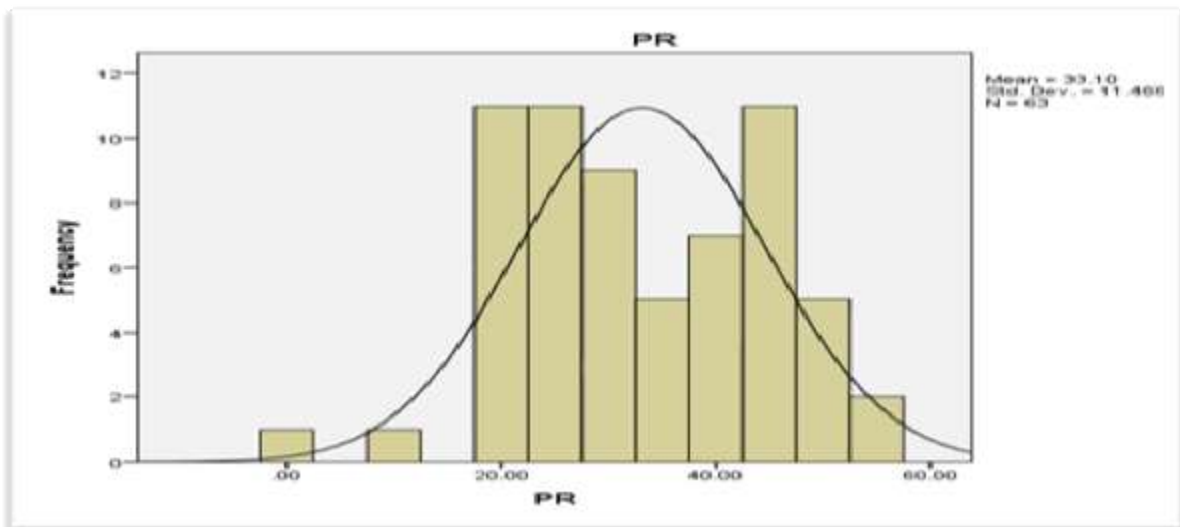
Figure 8-6: Histogram of Political Readiness

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The figure 8-6 above presents the distribution of the scores of political readiness as very uneven. The distribution is negatively skewed with substantial peaks before the mean score. This is an indication that fewer of the respondent institutions view themselves as being politically ready for E-government diffusion as a large number of the respondents scored below the mean score.

8.7   The Assessment of Stakeholder Readiness of the Institutions

Since various government institutions provide service to different types of stakeholders, these stakeholders could largely influence the success of E-government diffusion in a way when it comes to the adoption of the E-government services (Bryson, 2004). Various studies on the adoption of E-government adopt a one-data-fit approach to study, for instance, citizen capacity to adopt new technologies in a particular country (Ayuso et al, 2011). However in the developing countries, stakeholders within certain districts and regions might not have the same characteristics which could facilitate the adoption of technological innovation.

The predictor variables used in the assessment of the Stakeholder Readiness (SR) are presented in the table 8-9. The institutions surveyed were asked to rate their stakeholders readiness to adopt E-government from the institutions' perspective using these variables. The analysis of the data from the survey is presented descriptively in table 8-10 and graphically in figures 8-7 and 8-8.respectively

Table 8-9: Predictor Variables for Stakeholder Readiness

Predictor Variables	Code
Access Telecommunication Services	ST
Utilization Capacity	SC
Awareness	SA
Socio-Political Culture	SC
Stakeholder Readiness	**SR**
Maximum Score	**MS**

Table 8-10 below presents the descriptive analysis of the data from the survey on the stakeholders' readiness to adopt E-government from the institutions perspective. The mean score for the stakeholders' capacity for utilization of E-government service (12.80) is low indicating the institutions believe that many of their stakeholders might have challenges in utilizing E-government services. This would have a significantly negative impact on potential adoption of E-government and the success of E-government diffusion. Stakeholders' access

to telecommunication infrastructure and services has a significantly high mean score of 10.89, reflecting the increasing access to mobile communication services

Table 8-10: Descriptive Analysis for Stakeholder Readiness

Statistics							
		SC	SS	SA	ST	SR	MS
N	Valid	63	63	63	63	63	63
	Missing	2	2	2	2	2	2
Mean		12.8095	13.1111	7.0317	10.8889	43.8413	80.0000
Median		13.0000	13.0000	7.0000	11.0000	43.0000	80.0000
Minimum		.00	5.00	3.00	.00	27.00	80.00
Maximum		18.00	19.00	13.00	16.00	57.00	80.00
Percentiles	25	12.0000	11.0000	5.0000	9.0000	40.0000	80.0000
	50	13.0000	13.0000	7.0000	11.0000	43.0000	80.0000
	75	15.0000	15.0000	9.0000	13.0000	49.0000	80.0000

Figure 8:7 below presents the graphical analysis of the Stakeholder Readiness (SR) of the institutions surveyed and the score of its predictor variables. With a maximum score of 57 points out of 80, a minimum score of 27 and a mean score of 43, the level of stakeholder readiness for the adoption of E-government is presumed fairly high by the institutions surveyed. This indicates a fairly high average Stakeholder Readiness (SR) of the institutions surveyed and provides a positive indication that the stakeholders of the institutions scoring high in SR would have better prospects of E-government adoption by its stakeholders
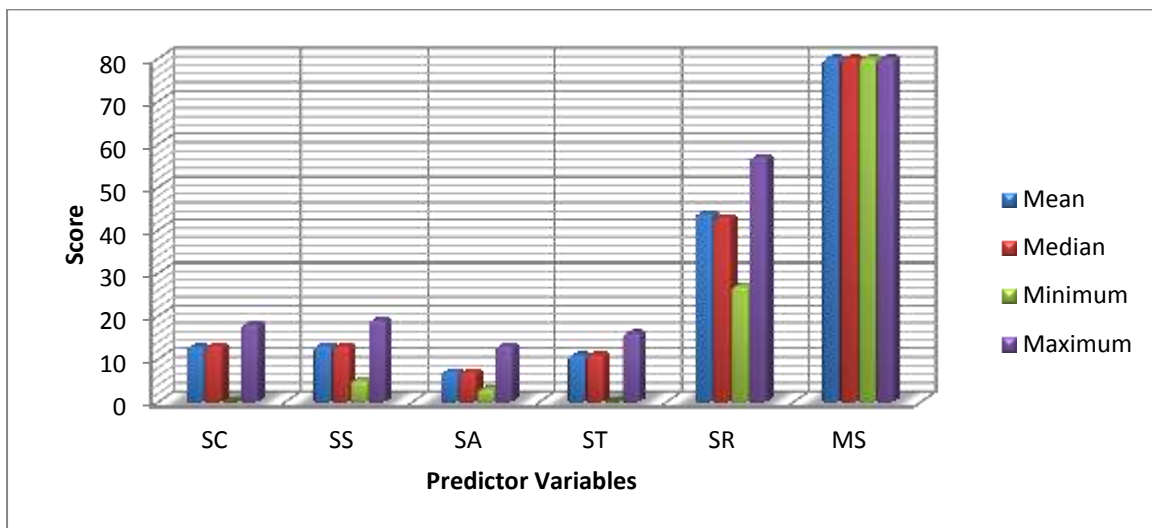
Figure 8-7: Graphical Presentation of Stakeholder Readiness

Figure 8-8 below presents the histogram of the distribution of Stakeholder Readiness among the institutions surveyed. It shows a significant normalcy in distribution of the mean scores.

The distribution curve peaks around the mean score, an indication that substantial number of the sample rates their stakeholders as fairly ready to adopt E-government if they implement it
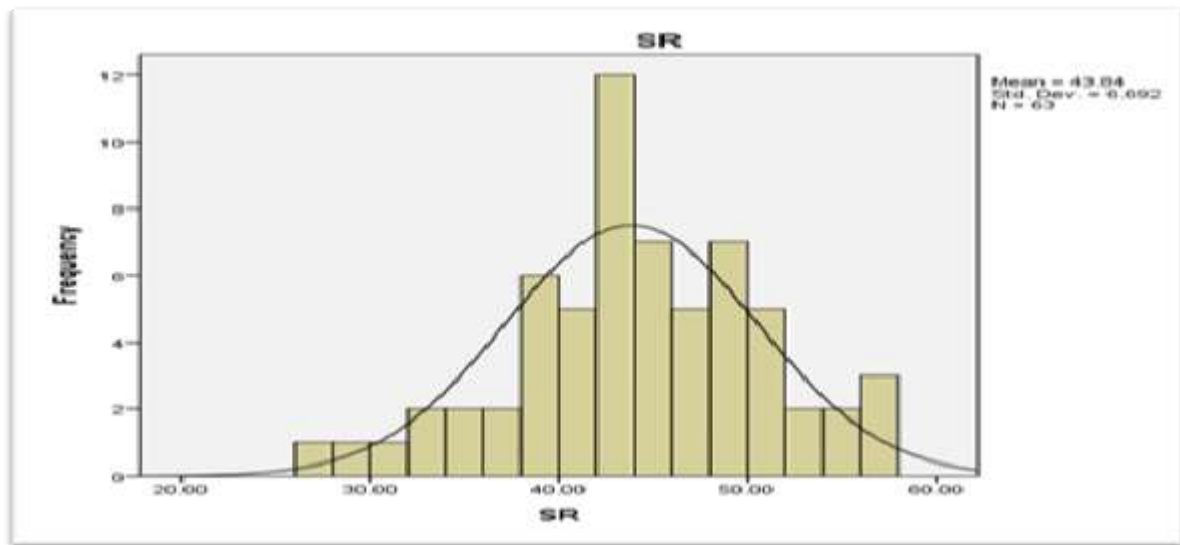
Figure 8-8: Histogram of the Distribution of Stakeholder Readiness

8.8 The Composite E-readiness of the Institutions Surveyed

This chapter set out to assess the readiness of the decentralized institutions for the diffusion of E-government as a tool for decentralization. Table 8-11 shows the key indicators and points scale for which they were assessed. The points were allocated based on the validated number of predictor variables for each key indicator and the number of questions determining each predictor variable from the previous chapter. This section thus provides an answer to the first research question as to the state of E-readiness of the decentralized institutions for the diffusion of E-government.

This section provides the cumulative score of the four criterion variables, Technological Readiness (TR), Organizational Readiness (OR), Political Readiness (PR) and Stakeholder Readiness (SR) to present the overall E-readiness of the institutions surveyed for the study

Table 8-11: Key Indicators and points allocated

The Key Constructs	Code	Points
Technological Readiness	T	105
Organizational Readiness	O	105
Political Readiness	P	80
Stakeholder Readiness	S	80
E-readiness	**ER**	**370**

Table 8-12 below presents the comparative analysis of the four criterion variables (main constructs) and compares their composite score to a total maximum points of 370 available. The table provides the descriptive analysis of the criterion variables analyzed and the mean E-readiness score is 173.07 out of the total of 370. The score indicates a fairly moderate level of E-readiness among the institutions surveyed. However, with negative skewness, it means many of the institutions surveyed have low E-readiness levels for E-government diffusion.

Table 8-12: Descriptive analysis of E-readiness

Statistics							
		T	S	O	P	ER	MS
N	Valid	63	63	63	63	63	63
	Missing	2	2	2	2	2	2
Mean		45.1905	43.8413	50.9524	33.0952	173.0794	370.0000
Median		44.0000	43.0000	52.0000	31.0000	173.0000	370.0000
Skewness		.161	-.287	.107	-.167	-.104	
Std. Error of Skewness		.302	.302	.302	.302	.302	.302
Minimum		15.00	27.00	19.00	.00	101.00	370.00
Maximum		78.00	57.00	84.00	53.00	253.00	370.00
Percentiles	25	31.0000	40.0000	33.0000	23.0000	149.0000	370.0000
	50	44.0000	43.0000	52.0000	31.0000	173.0000	370.0000
	75	58.0000	49.0000	66.0000	44.0000	202.0000	370.0000

The figure 8-9 shows graphical presentation of E-readiness levels of the sampled decentralized institutions. The institutions sampled show an E-readiness with the mean score of 173 of the maximum 370 available score. Technological and Organizational Readiness have the mean scores of 45 and 51 respectively. Political Readiness has a means score of 33 with stakeholder readiness having 44 as the mean score. This analysis shows a generally low level of E-readiness among the institutions surveyed.
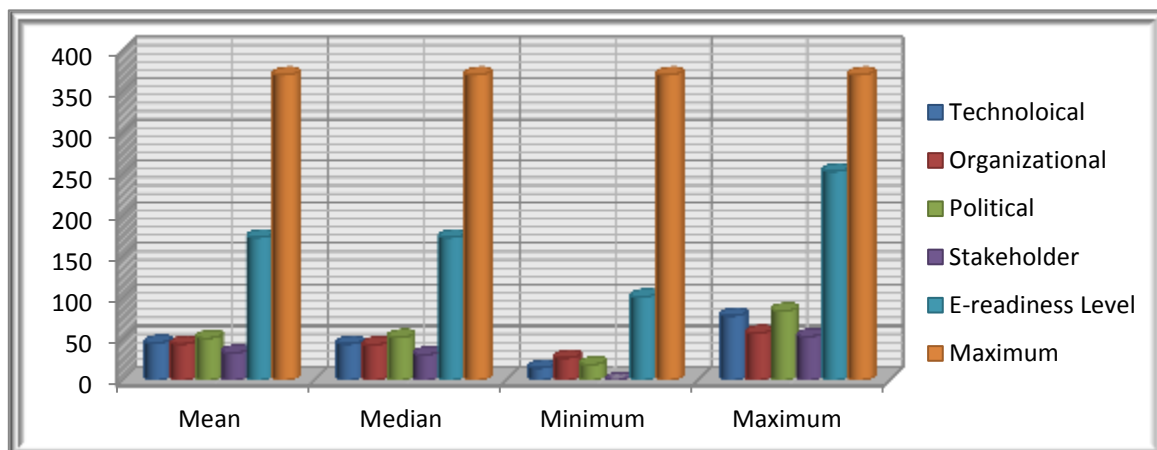
Figure 8-9: Graphical Presentation of E-readiness of the Institutions

Figure 8:10 below presents a histogram with the distribution of the scores for E-readiness of the sample. It indicates a fairly normal distribution around the peak. The distribution of the scores compact between 100 and 250 with a greater number of the institutions sampled scoring between 150 and 200 on the E-readiness scale. Very few scored above 200 and break into the 75% quartile. This means a greater number of the respondents is within the 25% and the 50% quartile.
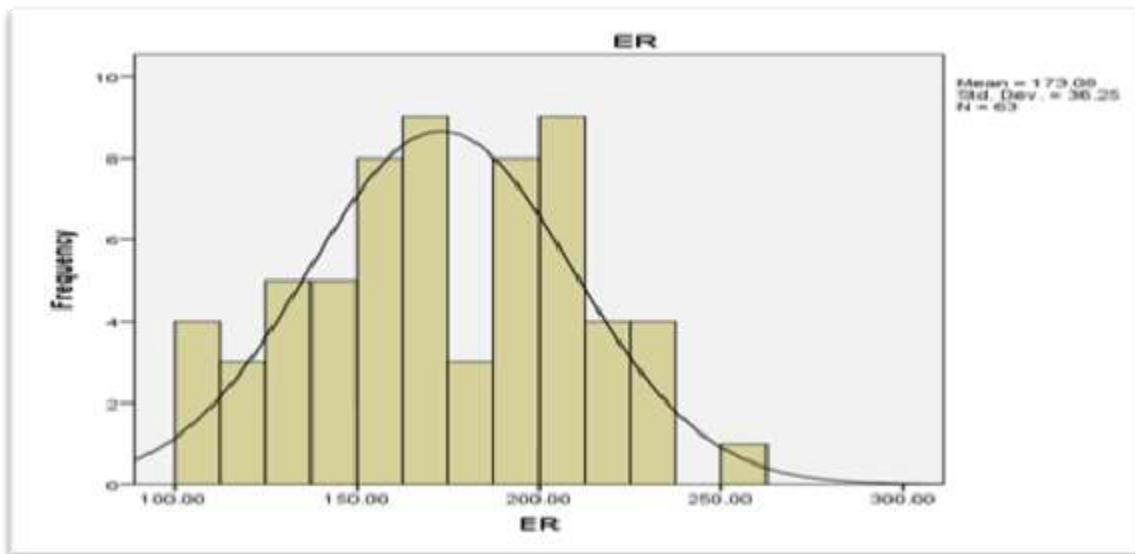
Figure 8-10: Histogram of the distribution of the level of E-readiness

8.9   Qualitative Data Analysis: E-government as a tool for decentralization

The study adopted a mixed method approach and triangulation of analysis to facilitate the answering of the four research questions posed for this study. Having used quantitative data analysis to determine the level of E-readiness of the institutions surveyed, a qualitative data analysis is used in the subsequent sections to clarify and provide further understanding of the results from the quantitative analysis (Kimchi, Polivka, & Stevenson, 1991). The qualitative data was collected concurrently with the quantitative data to avoid losing the same respondents from the institutions surveyed as well as potential change in the perceptions and attitudes of the respondents.

This qualitative analysis facilitated the answering of the three research questions as to the extent of the impact of E-government on decentralization, factors influencing the use of e-government as tool for decentralization and the extent to which e-government is being employed in the decentralization process. The qualitative data used for this analysis was collected through the analysis of relevant documents, by interviewing officials both at the

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local as well as national levels of the institutions surveyed, through participant observation at an E-government capacity building workshop as well as through an open ended questionnaire administered randomly on some ministries, departments and agencies (MDA(s)) in the various regional and district levels.

8.10 Document Analysis

The use of documentary analysis is an important integral part of qualitative studies. This is much so when one is studying issues relating to government policies (Gulati, Yates, & Williams, 2012). To unearth the policy direction of E-government diffusion in Ghana and local governance, it was crucial to examine various government policies in these two areas to identify any convergence or otherwise. The value proposition of both E-government (Ke & Wei, 2004) and decentralization (Crook, 2003) seem to converge and they could be used to complement each other to obtain the maximum benefits of both governance strategies.

The relevant policy documents analyzed to identify the policy relationship between E-government and local governance is listed in Table 8-13 below.

Table 8-13: Policy Documents Analysed

No	Policy Document	Dated
1	Ghana ICT4AD Policy Document	2003
2	National Telecommunications Policy	2004
3	National Broadband Strategy for Economic Development	2010
4	National Policy on Public Private Partnerships	2011
5	Medium-Term National Development Policy Framework; Ghana Shared Growth And Development Agenda (GSGDA), 2010-2013; Ministry of Communications	2011
7	Decentralization Policy Review	2007
8	Intergovernmental Decentralization Framework	2008
9	Decentralization Policy Framework	2010
10	Budget Statement and Economic Policy of the Government of Ghana for the 2013 Financial Year.	2013

The essence of analyzing these documents which are some of the most current policy and review documents is to know whether there are linkages in the pursuance of E-government strategies that further decentralization.

The analysis of the policy documents listed above showed that the Ghana ICT4AD policy document (Ghana ICT4AD) is the only policy yet that provides the linkage for using ICT to promote governance at the local levels as outlined in pages 41-43 and 57-60. The National Telecommunications Policy and the National Broadband Policy encourage expansion of telecommunication infrastructure to the rural areas to facilitate development. Ghana Investment Fund for Electronic Communications (GIFEC) has been set up to facilitate universal access to telecommunication infrastructure and services to un-served and the underserved areas in the country.

The analysis of the policy documents emanating from the two key sector ministries involved in decentralization and ICT and E-government diffusion in the country provides no clue of a concerted effort or a clear strategy to use E-government as a tool for decentralization. The decentralization policies reviewed did not provide the districts the needed political power to initiate major E-government projects on their own.

8.11 Interviews; Analysis of the Impact of E-government on Decentralization

To further understand the E-government diffusion process and the impact the process is having on the decentralization process, selected heads of institutions were interviewed. The object of these interviews was to ascertain the initiators of E-government innovation, source of funding and the priority being given to the implementation process. A selected number of heads of both the regional and local government administrators were also interviewed to assess their role in the E-government diffusion process in their institutions and the extent of the impact of E-government diffusion process, decentralized services delivery and decision making in their institutions. Documentary review was also utilized in this process. Some directors of the E-government implementation agency (NITA) were also interviewed.

8.11.1 E-government Diffusion Process; Institutional and Regulatory Frameworks

E-government diffusion in Ghana takes its root from the Ghana ICT Accelerated Development Policy initiated in 2003 according to an Official at the National Information Technology Agency (NITA). According to the official, NITA is the responsible institution under the Ministry of Communication tasked with the implementation of E-government in Ghana. NITA was established by an act of Parliament to replace the Ghana Information Technology Directorate at the Ministry of Communication.

The official explained that all the foundations of E-government implementation have been laid. He mentioned that E-government Enterprise architecture and an Interoperability Framework for the implementation of E-government have been put in place. Emphasis was

placed on key bills passed in 2008 namely; the Electronic Transactions Bill, the Electronic Communications Bill, the National Communications Authority (NCA) Bill and the National Information Technology Agency (NITA) Bill.

On the issue of lack of awareness among heads of the decentralized departments and institutions outside the capital of all the E-government implementation and legal frameworks in, the NITA official opined that there are ongoing capacity building workshops which involves all Chief Executive Officers and Chief Directors of Ministries, Departments and Agencies, Ministers of state and local government heads and other leading officials. At one of such workshops, 15 out of the 50 officials turned up for the workshop since these officials were not obliged to attend.

One Director mentioned that NITA lacks the adequate technical manpower to undertake all the projects required under the E-government. Mention was also made of the fact that the E-government in Ghana depends mainly on loans and grants which come with certain conditions such as who should be the specific vendor. The official suggested;

"Increase in number of technical human resource capacity; Regular upgrade of technical skills and expertise through required technical capacity building; Strong political backing and support of E-governance program and Funding of E-governance program /activities from Central Finance Ministry in addition to loan credits and grants received from donor partners" as vital to the successful diffusion of E-government in the country as whole.

8.11.2 Government's Commitment and Funding for E-government Diffusion

Many of the CIOs and the heads of institutions interviewed opined that there is lack of commitment from government for E-government implementation. An example was cited in the last few government budgets which have mentioned the acquisition and distribution of hardware without the applications that would deliver the actual transformation that ICT brings in public administration. A few of the District Chief Executives explained that computers and printers were supplied to the districts from the central government to replace their typewriters which are now outmoded. This is an indication of the continued centralization of the procurement for the supposedly semi-autonomous district assemblies.

The continued centralization of the institutions was re-echoed by one head of a regional institution who quipped; *"In Ghana, you can be born and die anytime you want while you go about your life. Since 2008 we have been informed of computerization of our operation yet we still fill out forms and send to Accra, wait for up to a month for certificate to be issued"*

When contacted, a regional coordinating director referred to the 2013 budget statement as an indication of the government commitment to E-government. The relevant parts are quoted below;

"Mr. Speaker, Government procured and distributed 108,000 laptops under the Better Ghana ICT Project with the aim of promoting skills and knowledge in Information Communication Technology among pupils and students countrywide"

"Mr. Speaker, in line with the Government's commitment to accelerated development, access to Information and Communication Technology (ICT) has been identified as a necessity to advance this agenda. In this regard, the Government will continue the construction of the 600 km rural-urban fiber optic broadband infrastructure from Ho to Bawku"

"Government will procure and distribute 100,000 laptops to individuals and educational institutions to promote the teaching, learning and use of ICT. Government will also provide training for the youth in assembling and repairing of ICT equipment, promote skills and knowledge in Information Communication Technology and create jobs" (The Budget Statement and Economic Policy of the Government of Ghana for the 2013 Financial Year., 2013).

There was no mention at all about using technology for public services delivery. Therefore, 10 years after the adoption of ICT policy for accelerated development; E-government has very little impact on the decentralization.

8.12 Funding for E-government Diffusion

Funding continues to be a hindrance to effective diffusion of e-government in Ghana since the government continues to face huge funding gaps in its programs, hence E-government in the local government systems does not appear on the radar of priorities. This was evidenced in the Medium Term Strategy for the Ministry of Communication. The amount that would be required for the implementation of the Sector Medium Term Development Plan for the period 2010-2013 is **GH¢ 83,412,372.35** (About 42 million US Dollars at the current exchange rate).

The Ministry's cumulative budgetary allocation for the plan period from the Government of Ghana would amount to GH¢ 29,411,351 (about 15 Million US Dollars). The remaining GH¢ 54,001,021.35 (about 27 Million US Dollars) which is more than 50% of the required amount is expected to be sourced from donors and from internally generated funds (IGF) (Medium-Term National Development Policy Framework; Ministry of Communications, 2010).

8.12.1 E-government Project Initiation

Ghana's E-government projects are mostly donor and vendor-led. Most of the institutions surveyed did not have a role in even the purchase of computers for their organizations. At one Regional office, Video Conference equipment provided by the government about 2 years ago were still in their boxes while one Regional Coordinator, the top civil servant in the region, was not aware that WIMAX Network for Internet Connectivity at the regional administration has been installed.

An official cited two E-government projects which have achieved some level of success and which deal with revenue generation and hence attracting the government and vendor attention; however when it comes to the local government, most of the Local authorities are not resourced enough to initiate their own E-government projects and the government-initiated projects for them takes place without a recourse to their needs. This was evidenced in the response received while interviewing local government officials.

One Municipal Chief Executive cited the development of one Website for all Metropolitan, Municipal and District assemblies in the country; http://www.ghanadistricts.com/home/. He mentioned that they are paying a large amount of money every quarter for the maintenance of the said site which contains very little about the districts.

"We could have developed our own website with our domain name and use it for our operations but given the amount of money deducted at source for this general website how do I justify a new website unless I am authorized by my minister to do so? I will cause financial loss to the state" he concluded.

This sense of central government control was echoed by many of the heads of institutions interviewed.

"You are asking about why we have not developed any e-strategy, the problem is if we do I would be told the ministry of communication is doing this and that. So we are waiting for what they are doing" One District Coordinating Director responded.

At the Ministry of Local Government and Rural Development, which is the responsible ministry for the decentralization, they have very little dealings with E-government at the local level; The Director who was interviewed mentioned illiteracy and lack of Internet access as problems militating against E-governance at the local governments. When asked why most of the districts do not have telephone enquiry line despite the fact that most of these districts have access to mobile telephone service and most of the illiterates have phones, he asked *"Is that one too E-government?"*

He further directed the interviewer to the Ministry of Communications claiming they are responsible for technology issues so any questions about E-government should be directed at them and not the Ministry of Local Government.

8.12.2 Factors influencing E-readiness in the Local Government Institutions

To identify the factors influencing the level of E-readiness in the local government system as evidenced in the E-readiness assessment of the departments and agencies surveyed, local government officials were interviewed and others surveyed with open-ended questionnaire to determine the various factors, both internal and external to their institutions, which are influencing the level of E-readiness of their institutions. Their responses are presented below in Figure 8-11. The analysis seems to corroborate the findings from the quantitative analysis on the E-readiness of local government institutions with regard to the factors militating against E-readiness of the local government institutions for E-government diffusion.
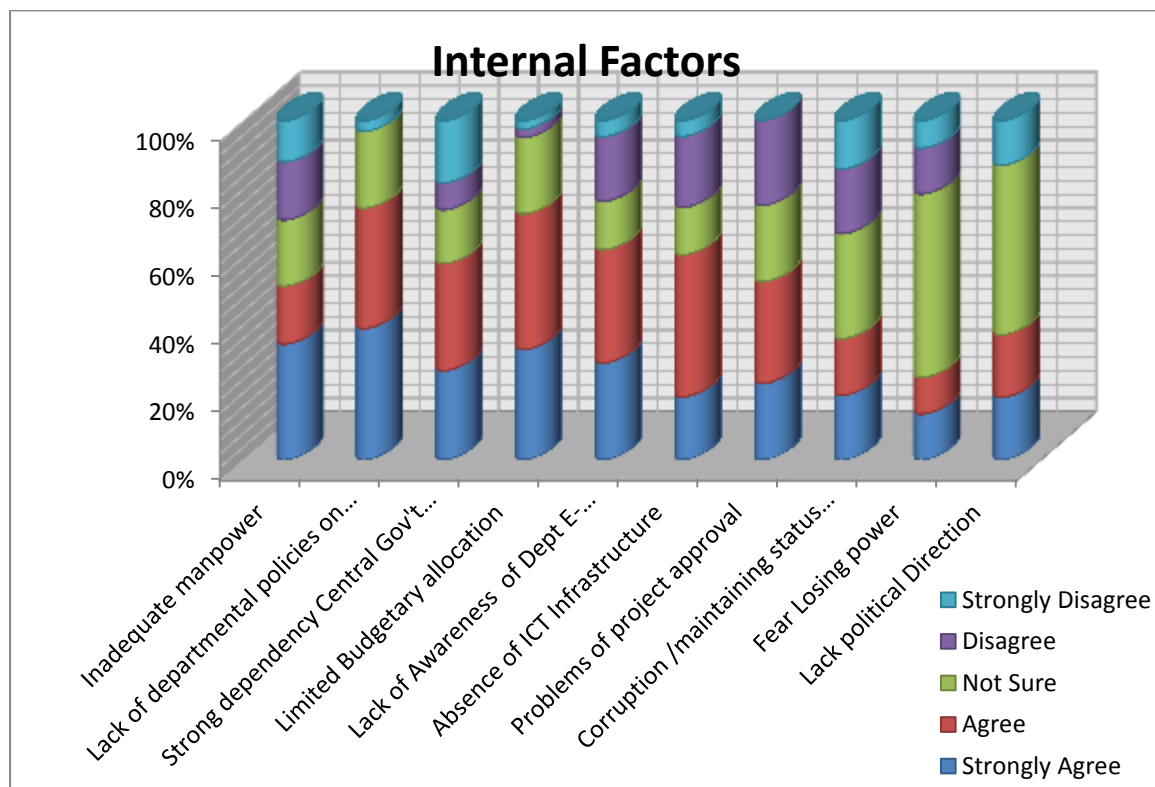
Figure 8-11: Internal Factors affecting E-readiness

In figure 8-11 above, the responses from the district coordinating directors interviewed highlighted lack of awareness, limited budgetary allocation, inadequate skilled manpower and absence of clear departmental E-government policies as key internal factors affecting their readiness to diffuse E-government. The absence of requisite ICT infrastructure in the departments and agencies is also a contributing factor to the low E-readiness as identified in

the quantitative analysis. The respondents were however mostly, not sure whether corruption, fear of losing power and political direction were negatively affecting their E-readiness and by extension E-government diffusion.

Figure 8-12 below provides an analysis of factors identified from the interviews and the survey of local government officials as external factors affecting their E-readiness for E-government diffusion. Central government funding, central government policies, lack of central government direction, absence of political will, illiteracy and inter-departmental relationships are the dominant factors negatively affecting their level of E-readiness. The respondents were, however, not sure whether corruption and absence of mandatory diffusion are affecting their E-readiness.
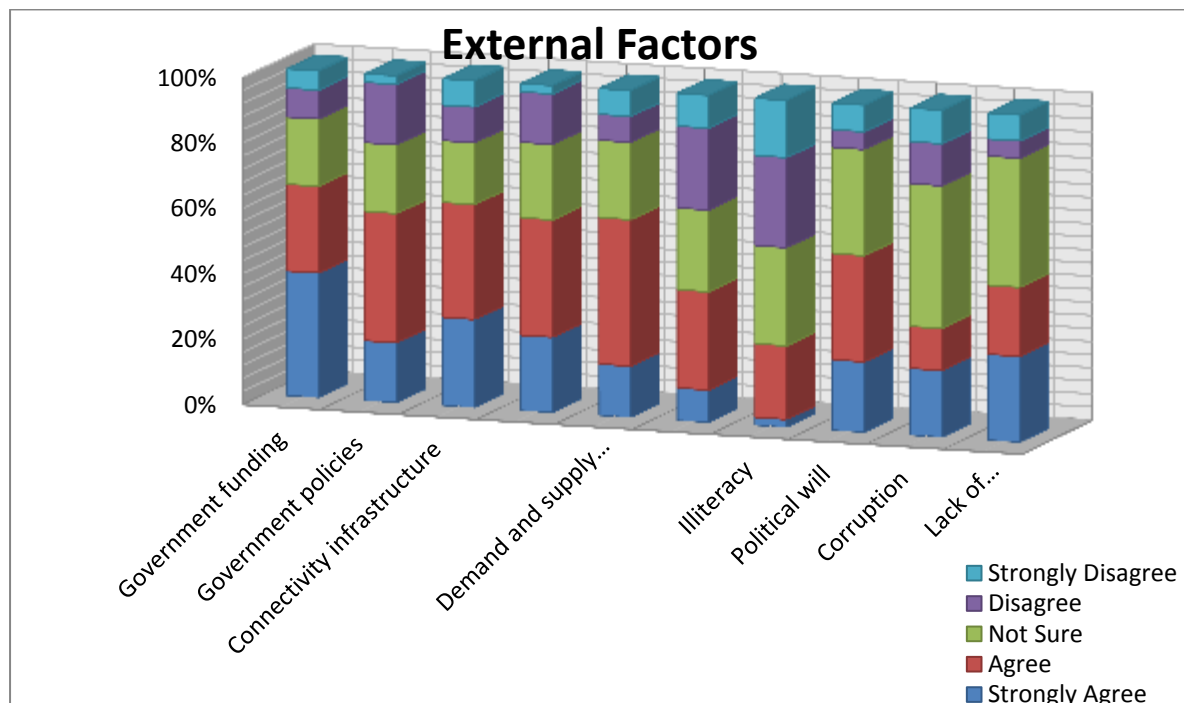
Figure 8-12: External Factors Influencing E-readiness

8.12.3 Relationship between District Administration and Decentralized Agencies

The local government system is a complex arrangement. The district assemblies and the district administration maintain the administrative controls in the various metropolitan, municipal and districts. However, ministries, departments and agencies maintain control over the decentralized departments, taking instruction from their regional and national officers rather than the local administrative heads. The regional offices perform coordination and monitoring roles.

Provision of public services is therefore, shared between the various levels of government. The overall policy for governance and services remains the preserve of the central government while the provision of facilities and services such as education and healthcare are shared between the central government and the Metropolitan, municipal and district assemblies.

"*This strong umbilical cord between the decentralized departments and their parent ministries and departments makes it nearly impossible for a decision by the local government officials to manage them. They have their own budget and their operations are not necessarily under the local government administration*" says one Regional Coordinating Director.

A number of the local officials interviewed attributed lack of local initiatives for E-governance to strong central government controls and operational guidelines and statutory laws that seem to punish officials who take initiatives and fail. A number of the District Coordinating directors mentioned the fear of being charged under 'willfully causing financial loss to the state" should they fail in any initiative of e-government diffusion on their own, so they are always waiting for the "order from above". There is lack of independence for local decision-making, which negatively impacting on the diffusion of E-governance in local administrations.

The figure 8-13 shows the relationship between the decentralized ministries, departments and agencies and various levels of government.
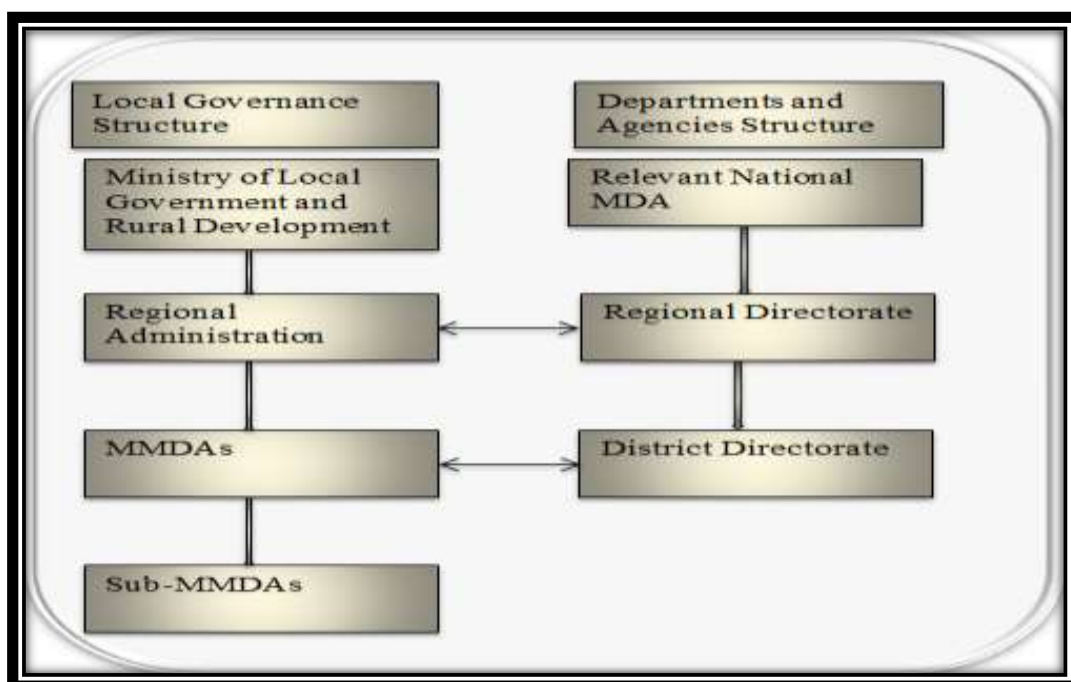
Figure 8-13: Relationships between decentralized department and local government

Like many other decisions at the local level, E-government decision is out of the hands of local government officials in Ghana. Most of them indicated that they are waiting for direction from "Above", that is, from the central government where there was evidence of hardware bought for some local institutions by the national office that they have not requested for. E-government implementation is in a way recentralizing the procurement decision for ICT equipment and services.

CHAPTER 9

9   FINDINGS, RECOMMENDATIONS AND CONCLUSION

9.1   Introduction

This chapter summarizes the findings from the study among which are the low level of readiness resulting from lack of awareness, e-strategy and political support for E-government in the local governance in Ghana. Recommendations for the way forward are also given with a proposal of an architectural framework to integrate local government services on a local government portal to enable citizens have access to multi-channel public services delivery and participation in governance, and reengineering of the current local government system to enable local innovation. In the conclusion the limitation and the future direction of the study have also been discussed.

9.2   Findings

The findings of this research were from the analysis of both the qualitative and quantitative data gathered for this study. Findings from the quantitative analysis mainly deal with the assessment of E-readiness while the qualitative analysis led to the findings on the implementation and the innovation decision processes.

9.3   E-readiness of Decentralized Institutions for E-government diffusion

The evidence from the E-readiness assessment done using the TOPS model developed and validated for this study shows a generally low level of E-readiness of decentralized departments and agencies. Local government administrators themselves also showed low level of E-readiness. The level of E-readiness is shown by the low scores obtained from assessing all the criterion variables of the TOPS Model.

9.3.1   Technological Readiness

Technological Readiness is still low among decentralized institutions. These institutions have improved access to telephone services due to the growth in the accessibility of mobile phones. There are also a number of them with Internet access but rate the quality as low. One area of low readiness is the absence of web presence as most of the decentralized institutions have neither a website nor official email systems. Despite widespread use of computers in these institutions, service delivery processes are still manual with both internal and external communication still paper-based. One would expect these organizations to offer telephone

inquiry service in an environment of improved mobile telephone access. Computers are stand-alone in certain situations, each connected to a different printer. Absence of technical expertise, too, had a negative impact on Technological readiness with many of these institutions rating both internal and external access to technical expertise very low.

9.3.2 Organizational Readiness

Most of the decentralized departments and agencies are not reengineered to take advantage of E-government and digitized public services delivery. Many of the organizations have highly qualified staff since most of the heads of these organisations have a university degree. They have people who are considered competent in the performance of their duties. ICT literacy is fairly high among staff but organizational awareness to benefit from E-government is low. Services and channels for E-governance have not been identified and there is no hurry to change the status quo. This can be attributed to lack of encouragement for local innovation due to the pertaining centralized decision making from the "top". One is confronted with "*this is how it is done here*" and "*this can only be done abroad*" when a suggestion of an electronic mediated service delivery to enhance transparency and citizens participation is offered.

Resource availability and commitment for E-government are practically non- existent with most departments putting their IT budget under stationary budgets. This was evident at a police regional CID and all District CID offices surveyed where there were no computers to record cases under investigations. The low organizational commitment to E-government is evidenced in the operations and management of the websites of the ministries, departments and agencies in Ghana. For instance, at the time of carrying out this study, the website of the Ghana Fire Service (www.ghanafireandrescue.org) which was launched two years ago with a fanfare was non-functioning. The Ministry of Interior's website shows that some heads of department the ministry who have been out of service for five years are still displayed as occupying their positions.

9.3.3 Political Readiness

The decentralized departments and agencies view the problem from the top. The political commitment to E-government and E-governance remains rhetoric. Legal and institutional frameworks have been put in place mostly to satisfy international and donor commitments. Some of the heads of department surveyed have not heard of the National Information Technology Agency and neither are they aware of the role they play. The acceptance of electronic mail and responses to email enquiries even with the few organizations that have

official email addresses is practically non-existent. Policies and programs that have been put in place are not monitored and evaluated to ensure compliance and returns on investments, hence many of the organizations view investments in information and communication technologies as additional cost and not necessarily tools to improve operations and service delivery.

9.3.4 Stakeholder Readiness

With improved access to mobile communication, many of the local government areas have coverage with Internet connectivity. However, the quality of service is an issue. Given the pains citizens go through to obtain services, E-governance would come as a welcome relief. The local departments and agencies interact largely with literate population. However, most of the illiterate stakeholders have access to using mobiles phones, a service delivery model could therefore, be developed to provide services to them. Already, the school placement system and examinations results checking on ICT systems have gained wide usage among citizens. As mentioned earlier, telephone enquiry lines would go a long way to involve the stakeholders in governance and effective public service delivery. Most of the institutional stakeholders have educated staff and have access to communication services. With government coercive powers, the stakeholders could be compelled to adopt E-government services. Most of the organizations surveyed rated their stakeholders as fairly ready to adopt E-government.

9.4 Type of Decentralization and Institutional Relationships

The decentralization in Ghana is still not mature enough. It is a mere delegation of residual decision making powers from the central government and its agencies to the local administration as well as the department and agencies in the districts. The heads of local government administration, known as District Chief Executives (DCEs), Municipal Chief Executives or Metropolitan Chief Executives (MCEs) are appointed by the central government and the appointees are therefore, not accountable to the local people. The District Assemblies with 30% of the membership being central government appointees have little powers over the decision of the central government and their dependence on central government for resources makes it difficult for the local authorities to initiate innovation.

Departments and agencies in the local government areas owe more allegiance to their headquarters in the capital than the local people. The decentralization in Ghana is therefore classified as a delegation type. For effective implementation of E-government through local initiatives, there is the need for the devolution type of decentralization where departments and

agencies service the local citizenry under the local government system where the heads of local institutions are elected and therefore more accountable to the people.

There is a clear absence of linkage with and commitment to the lowest levels of the decentralization which is supposed to facilitate citizen participation at the local levels. The unit committees and town councils do not have designated offices where any administrative function can take place. Assembly members of various districts who were interviewed perceived their function as sacrificial and at best, status enhancing, since it is not a paid position. Meetings are held in church buildings and open spaces within the communities. Such situations make the diffusion of E-government in such institutions unpractical at the moment.

Devolution would allow for experimentation of innovation and the success could be replicated within the local government setup. The local government laws and the need for seeking approvals from the headquarters mean local agencies and departments hardly make any decision on their own but implement directives from the headquarters. It was no wonder that computers and other supplies that are sent to some of these decentralized departments are left unused because they have no need for them, whiles others were not aware of the existence of an E-services portal where citizens can have access to the electronic services being offered by their organization (http://www.eservices.gov.gh).

There are also no visible isomorphic pressures on local government institutions to diffuse E-government. The central government and the parent ministries, departments and agencies are not applying any coercive or normative pressures on the local level institutions to adopt E-government. Again, the absence of widespread adoption of E-government by other local government institutions is not inducing mimetic pressure on similar institutions elsewhere to diffuse e-government.

There is also an on-going financial management project dubbed Ghana Integrated Financial Management Information System (GIFMIS) as part of E-government project to decentralize budgeting and financial management of the local government administration as well as departments and agencies by the Controller and Accountant General's Department (CAGD) (Bediako, 2012). The impact of this project cannot be assessed now since it is yet to reach many of the local authorities sampled.

9.5   The Impact of E-government on Decentralization in Ghana

From the onset of this study, the impact of the e-government diffusion on decentralization especially in Ghana has been sought. In terms of policies, the decentralization process and E-

government diffusion are running parallel to each other with no prospects of convergence. Documents analysis, the questionnaire and interviews conducted show very little impact on the decentralization and for that matter local government system in Ghana. An analysis of both the decentralization and e-government policies provides no indications of a concerted or strategic effort to integrate the diffusion of E-government into the decentralization process in spite of the recognition of the potential of ICT in governance as highlighted in the Ghana ICT4AD and the Ministry of Communication Medium Term Strategy among other policy documents.

The implementation of the E-Ghana project, which is spearheading the diffusion of E-government in Ghana, is centralized with no input from the local government institutions at the regional and district levels. There are instances where even the procurement of basic ICT consumables is done from the regional or at the national level. A typical example is the use of a single domain name for all MMDAs website with the districts having no control over the management of the website. This accounts for the out-dated information and many other elementary errors on the website thereby rendering it almost useless as a source of any relevant information about the districts. If anything, the process of diffusing E-government is rather taking some of the autonomy the districts have in decision making by recentralizing them.

The legal and institutional frameworks of the decentralization and E-government diffusion make it difficult for the convergence of these two policies with almost the same goals. The requirement for NITA to have offices in the regions to oversee the implementation of e-government in these areas is yet to be implemented. Lack of coercion and political commitment account for some of these, even though officials were inconclusive on whether this is as a result of the fear of losing power at the national level or the fear of causing financial loss to the state. Lack of funds has also made it impossible for the districts, departments and agencies to take their own initiatives to embark on basic E-governance.

The relationship between the district administration and the department and agencies in the district are one of consultation since the departments and agencies are not under the authority of the district administration but the parent ministry, department or agency of the central government. The district administration themselves are subjected to strong control of the central government, The District Chief Executive is handpicked by the government and 30% of the district assembly members are government appointees. Low web presence and the absence of E-strategies in most of the districts surveyed means that electronic interactions and communication between citizens and their representatives in both national and district

assemblies remain very limited. Most of the districts, departments and agencies visited did not have official enquiry telephone lines despite the existence of mobile phone connectivity. Often one has to call personal numbers or travel to such offices for enquiries.

9.5.1 Current Service Delivery model

ICT is being introduced in the local government system with no change to the operational and service delivery models that have existed. Public servants still treat public service delivery as if the citizens are being done favours. The organizations with websites do not update their sites and decentralized agencies and departments do not even visit their websites, hence many have little or no use for their website. The existing telecommunication connectivity infrastructure is not being used for better services delivery and many of the heads had no clue as to the plans of their department to embark of E-government. Forms from the e-services portal printed for this study to register a business were rejected at the registrar generals department and a new slightly different form issued for business registration. There seems to be no interest to ensure E-governance takes root in the public services institution. The message below is the response received upon registering to access the e-services portal:

 *"Dear**Patrick,***

Thank you for confirming you registration. You have received this message because you are now authorised to the eServices portal. With this message, we confirm that you can now login in you're account of the eServices portal with the user name and password provided during the registration process. This is an automated message from the eServices portal of the Government of Ghana as a result of your registration to the site www.eServices.gov.gh"

The language in this feedback is an indication of the level of seriousness attached to the operation of the services and whether citizens are actually utilizing the services offered on the portal requires further investigation.

9.5.2 Diffusion Strategy: Vendor and Donor Led Innovation

National resource allocation to E-government implementation was rated very low and the implementing agency agreed to this. The e-Ghana project is donor-led with a specific vendor undertaking the provision of the network infrastructure. Ghana has very lofty plans on paper for implementation. However, the local government areas are yet to see any improvements. This vendor-led innovation does not involve the beneficiary organization in the innovation decision process hence the acceptability, use and institutionalization of the innovation is negatively affected.

An instance of such negative effects was identified with the installation of WIMAX Networks in the ministries and departments (Bediako, 2012). One chief executive reported that the quality of services leaves much to be desired, hence his organization is opting for private Internet service providers while at some of the regional administration, a number of the departments and agencies were not even aware of the existence of the service.

Barely 2 years into the installation of this WIMAX network, is it the same vendor who is undertaking the expansion of the networks and replacing WIMAX network with LTE. To what extent was the WIMAX network utilized for the benefit of the beneficiary institutions?

There is lack of decentralisation in the diffusion of E-government in Ghana. Decisions are made from the national capital with no inputs from the local level to satisfy local needs. There have not been any conscious efforts to assess E-readiness in the various local government areas prior to the launching of the E-Ghana project.

9.6   Recommendations

For E-government to be used as a tool for decentralization, the development of district portals with all the decentralized departments and agencies providing information on their services would provide local citizens the means to interact and transact business with officials and access services from such portals to circumvent the existing balkanized decentralized system which involves just a delegation of residual decision making powers to local government officials.

9.6.1   Using E-government as a Tool for Decentralization

A critical analysis of the policy documents of both E-government and Decentralization gravitate towards same objectives (Fig 5-3 and Fig 9-1). E-government thus provides a potential tool for furthering decentralization given the four key facets of E-governance, namely E-service, E-democracy, E-commerce and E-management. These can facilitate devolution of governance. E-government makes it easier for dissemination of government information, interaction with government, intra and inter-departmental collaborations as well as transacting business with government (Drüke, 2005).

Fig 9-1 was extracted from various literatures to present the value propositions of E-government to decentralization and local governance for this study. The proposed values however cannot be realised under the current state of decentralization in Ghana given the parallel policy direction, the institutional relationships with the local administration and lack of decision making and financing autonomy of local departments and agencies. Certain laws

that hinder innovative drives from local administrators and heads of institution should be looked at to facilitate the diffusion of E-government as a tool for decentralization in Ghana.

The Ghana Government Enterprise Architecture for E-government should include the local government structures such as the area councils and town councils as service points and be equipped with the necessary technology to bring E-governance to the lowest level of the local government system.

9.6.2   E-government Diffusion Decision process

E-government being both a technological as well as an administrative innovation, the low E-readiness identified requires a hybrid approach to the E-government diffusion process. It is important that ministries departments and agencies are encouraged and guided to identify the areas and processes within their operations that require innovation. The E-government solution designed must be presented to these ministries, departments and agencies at capacity-building workshops, and set targets must be enforced to enable institutionalization of such E-government innovation.

E-government diffusion should combine centralized and decentralized approaches into a hybrid process. In this hybrid process, decision making such as the source of services and processes to be innovated by E-government should emanate from National Government and Technical/Subject-matter Experts and well as local officials who identify unique local needs. Decentralized agencies and departments should be encouraged to make an input for local adaptations of E-government services and implementation.

The direction of diffusion must also initially involve a top-down approach, from experts to local users who could be local e-champions. Peer diffusion through horizontal networks should then be encouraged so that local institutions would take ownership and institutionalize E-governance. The master-servant relationships in centralized diffusion breeds local resistance.

The source of E-government projects, too, should not always emanate from the top; local experimentations should be encouraged and promoted for peer diffusion and horizontal networks. The diffusion of E-government innovation should adopt a problem-centred approach and be technology-pulled so as to resolve locally perceived needs and problems with a high degree of local adaptation. The current innovation-centred technology push approach being employed does not endear E-government diffusion to some stakeholders.

9.6.3 Institutionalization and Stakeholder Awareness

Currently the e-services are not institutionalized within the decentralized departments and agencies in the local government areas because they have not been done in their parent departments and agencies themselves. There is therefore the need for strict guidelines and deadlines for the decentralised agencies and departments to deliver E-governance. The coercive powers of government could be invoked for the purpose of reengineering the governance process of the country.

Stakeholders of various institutions and their salience must be clearly identified so as to map out awareness creation and educational strategies to facilitate widespread adoption of E-governance. Knowing the stakeholders of E-government would inform the service delivery model and channel of delivery to adopt such services.

9.7 Conclusion

This research was carried out to investigate the diffusion of E-government in local governance and how it can be used as a tool for decentralization. To accomplish this, there was the need to assess the E-readiness of the decentralized departments and agencies for E-government diffusion. A model for assessing E-readiness was developed that was suitable for the environment and uses primary data from the local government areas. The model was validated and has been used to assess the E-readiness of these departments and agencies. Through this and other interviews, the factors affecting E-government diffusion as a tool for decentralization have been identified and recommendations have been made.

Given the nature of public service delivery in most developing countries and the increasing availability of mobile telecommunication coverage, E-government provides a potential tool to help in the decentralization of governance in these countries. One would not need to travel to offices in the capital or elsewhere to access services and or contribute to both local and national debates as well as interacting with their elected representatives. Citizens' voices are likely to be heard better and the convenience of accessing public services enhanced if E-governance is institutionalized.

These potentials would remain a mirage if the E-readiness of the institutions providing governance is not improved and to include stakeholders in the E-government innovation decision process. E-government cannot succeed in the existing rigid bureaucratic structures of government. Hence the need to reengineer government institutions and governance is imperative for the realization of the potential benefits of E-government to a developing country such as Ghana. This reengineering process must take into consideration stakeholder

characteristics and needs for effective adoption and institutionalization of reengineered systems. The implementation of an E-government project without institutionalization makes it worthless for both the stakeholders and the organizations concerned.

9.8   The Relevance of the Theoretical Framework to the Findings of the Study

The literature review and the theoretical framework used for this study were employed to explain what others have done in studying the diffusion of e-government in other developing countries. This was to provide a justification of the new approach to answering the research questions. The literature thus provided the larger context in which the research questions are situated, the current state of knowledge about the questions the study sought to answer and the importance of answering the research questions posed. This is to enable this research to provide further understanding and knowledge in the field both theoretically and practically. The literature enabled the evaluation of the appropriateness of the existing E-readiness measurement model and metrics, identified the shortcomings of the existing models and proposed an appropriate one for the study.

The multi-theory approach to this study facilitated the understanding of the multiple theoretical factors influencing the adoption and diffusion of information systems both at the individual as well as institutional levels. This supported the assessment model developed and provided answers to the research questions posed for the study. The theories used influenced the direction of the study from the technologically deterministic approach originally proposed for the study to incorporate socio-political factors which influence the diffusion and adoption of E-government.

The literature and theoretical framework used for the study thus provide convincing evidence of the socio-technical nature of E-government research. Thus a single theory might not suffice to explain or develop a deeper understanding and create further knowledge about E-government and E-governance. Throughout this study, evidence has been provided that where the diffusion of technology is not built on the critical analysis of the institutions involved using multiple variables supported theoretically, the diffusion might not result in the adoption of such technologies.

The literature and the theoretical framework provided the "why" underlying the TOPS model developed for E-readiness assessment. The reasons for choice of the four criterion variables and the predictor variables used to determine the state of their respective predictor variables which in turn determined the level of the E-readiness of the Institutions towards E-government diffusion were explained. However, understanding only the "why" could result

in empirical discussions rather than theoretical implications of the results of the study (Whetten, 1989); hence the theoretical direction followed in the study is very essential.

9.9   A Reflection on the Methodological Approach to this study

The successful execution of this study is largely due to the suitability of the methodology employed. The multi-disciplinary nature of this study and the types of research questions posed for the study required a methodological approach suitable for the various disciplines involved. This study straddles public administration, political science, management and information systems; hence the use of mixed methods approach provided the environment to answer the research questions. The methodology also helped to achieve the research objectives with the development and validation of an appropriate model for E-readiness assessment and provide in-depth knowledge and analysis of E-government diffusion in Ghana.

The research question posed for the study provided a framework for interpreting patterns, or discrepancies in the empirical observations of E-government diffusion. "What" and "How" questions provided a description of the observations and the "Why" question explains it. The study therefore utilized both qualitative and quantitative data to characterize the theory building and explain its characteristics. The ability to use both types of data is provided in the mixed methods approach thus making it plausible for this study.

Information systems research in a developing country such as Ghana is often beset with problem of data collection and distorted data interpretation often using secondary data from government supplied sources. These data often do not present what is on the ground. Hence using the mixed method approach in a situated research provided the access to valuable primary data from varieties of sources which could not have been possible through any other approach. The qualitative data was thus used to complement the quantitative data collected for the study with the qualitative data providing explanations for the findings from the analysis of the quantitative data. However, there was always the need to overcome the temptation of over-relying on the quantitative data to validly draw conclusions in a mixed-method study such as this study.

9.10   Value Proposition of E-government for local Government in Ghana

It is the conviction of this study that E-government provides a complementary tool for the realization of decentralization that has long eluded many a developing country such as Ghana The E-government policy and its implementation make little mention of integrating it with the current decentralisation process. It emphasizes shared services with no mention of the role

that the decentralised agencies would play in E-government in the country. A survey of literature unearths very tangible value propositions for local governments as shown in Figure 9.1 below.

The responsibilities placed on the local authorities should make them the centrepiece of the E-government programs in the country. The success of E–government in Ghana would largely depend on the effectiveness and the readiness of the institutions at the points of government services delivery to diffuse E-government in the country. If effectively diffused, E-government benefits both the government and the citizens. The E-government and the Decentralization policies must therefore for harmonised since both policies are aiming at the value proposition.
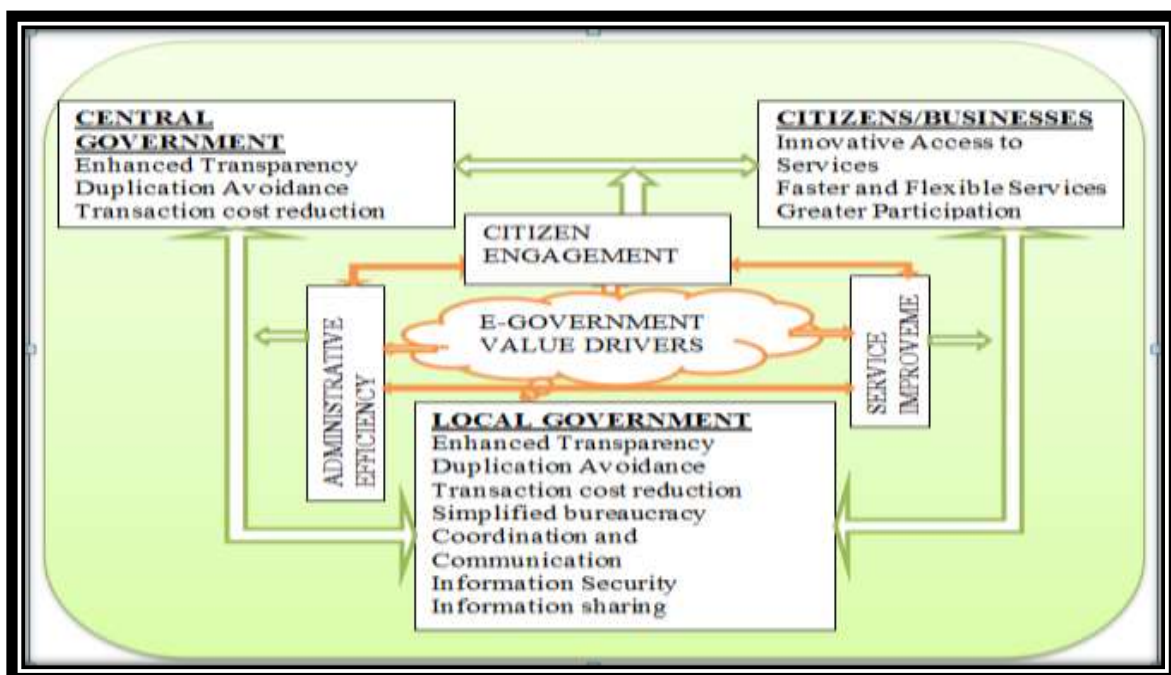
Figure 9-1: E-government Value proposition for local government

Adapted from (Falch, 2006; Palanisamy, 2004; United Nations, 2008; Scholl, 2005; Rose & Persson, 2012)

9.11 Research Contributions

The conclusion drawn above provides insights into the direction and the objectives of this research. The research has combined four theories namely; Diffusion of Innovation Theory, by Rogers, TOE Framework for technology diffusion, Stakeholder theory and Institutionalization theory to develop the technology, organizational, political and stakeholder (TOPS) model for Institutional E-readiness assessment. TOPS merges adoption and diffusion approaches in assessing E-readiness. This model has been statistically validated and

empirically used to assess the E-readiness of local government institutions as well as decentralized agencies and departments for E-government diffusion.

The study also shows that the view that access to technology as the dominant problem for E-government no longer holds empirically according to the findings of the study. It identifies political and other human factors as the dominant barriers to E-government diffusion and adoption in Ghana.

The need to approach E-readiness from an institutional perspective is highlighted due to the different stakeholders and diversity of the citizenry and the uneven development of different regions and districts in developing countries such as Ghana mean the use of data obtained from national averages gives misleading conclusions. The TOPS model depending on primary data from implementing institutions' perspectives provides a tool for identifying which areas need attention for successful diffusion and institutionalization of E-government.

The study leads to the proposal of a hybrid diffusion strategy combining both centralized and decentralized innovation diffusion strategies to facilitate institutionalization of E-governance.

9.11.1 Research Implication for E-government Implementation

This research has two broad implications for E-government diffusion in Ghana. Firstly, it provides a model for feasibility studies for government and other institutions intending to implement or diffuse any technological innovation by adapting the TOPS model to assess its E-readiness. It brings to the fore the prominence of human factors rather than technology as the dominant factors affecting E-readiness.

Secondly, it provides the Government of Ghana and the Institutions involved in E-government implementation the true state of the E-readiness of local institutions. It identifies the weaknesses in the areas requiring improvements if E-government is to facilitate decentralization. The interviews of the local heads of department provide the national decision makers an idea of the sentiments of their local heads which need to be factored into future E-government project implementations.

9.12 Potential Limitations of the Study

While much effort was made to ensure the quality of the study and the validity of the findings, the study findings could be affected by a couple of limitations. First, the data collected for the validation of the TOPS model for E-readiness assessment was taken from Chief Information Officers of the Government institutions and Agencies and their views might have been influenced by the politics in their respective organizations. Since the study

also involved the institutionalization for E-government, public sector experts such as local government experts could have been included in the survey.

Secondly, the assessment of E-readiness was done using the mean scores of the all the institutions surveyed, hiding the fact that some institutions and certain localities could score better than others. For instance, there is distinction between regional level institutions, metropolitan, municipal and district institutions. The data for the assessment was also collected from four out of the ten regions in Ghana.

9.13 Suggestions for Future Studies

The findings of and the observations made during this study give an impression of the need to study the national diffusion of E-government. This can be done by focusing on the projects touted as successful and the failed projects to identify the causes of failure and the drivers of success. This can be done using the TOPS model to study the technological, organizational, and political and stakeholder factors involved in the implementation. This would give a holistic view of E-government implementation in Ghana rather than the current focus of local government and decentralized departments and agencies. It is believed that effective diffusion at the national level would impact on the local and decentralized departments.

Validating and applying the TOPS model in a different developing country would also have to be explored. This would facilitate its promotion as a tool for institutions to assess their readiness for the implementation of particular E-government projects.

A nationwide data collection should be undertaken for comparative studies among the regions, metropolitan, municipal and district administrations and institutions as well as to determine the level of their E-readiness for the diffusion of E-government.

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Appendix 1: Questionnaire for E-readiness: CIO

The Objective of this questionnaire is validate a Model Developed to assess the E-readiness of Metropolitan, Municipal and District Administration as well as Ministries, Departments and Agencies to Use E-government as a tool for Decentralization. The Technological, Organizational, Political and Stakeholder (TOPS) Assessment takes Institutional Perspective. This is purely for Academic Research only, any information provided therefore would be treated confidential and solely for that purpose.

Thank You. Patrick Ohemeng Gyaase: Aalborg University, Denmark

1. **To what extend is Technological Readiness vital for your institution to Diffuse E-government?**

Assesses the ICT infrastructure of your organization to adopt e-government

      0   1   2   3   4   5

No Impact ⦿ ○ ○ ○ ○ ○ Highest impact

Access to quality and affordable Telecom Infrastructure, Both fixed and Wireless

      0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Access to Broadband Internet Connectivity

      0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Reliability and Speed of the Internet Connectivity

      0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Web Presence: Organizational Website and Institutional Email

      0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

The Level of Automation of the Business process of the Institution

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Availability of Technical Expertise

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Can you please suggest at least two important factors that would contribute to Technological Readiness and Rate Them?

[   ]

Organizational Readiness

To what extend would you consider Organizational Readiness as Vital to e-government Diffusion?

Assesses how ready the institution itself readiness to diffuse e-government

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

How would you Rate the following as Contributing to Organizational Readiness to diffuse E-government?

Administrative Competence: Competent Administrative Personnel

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

ICT literacy among the managers of your organization

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

E-Leadership: Management commitment to computerization

        0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Head of ICT as senior rank in the Institution

     1   2   3   4   5

No Impact ○ ○ ○ ○ ○ Max Impact

ICT Literate Head of Institution

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Organizational Awareness of the need to innovate

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Organizational Culture that encourages innovation

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Decentralized E-government Diffusion process

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Institutional E-Strategy: With identified E-government Service delivery Channels

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Adequate Budget/ Resource Availability for E-transformation

    0   1   2   3   4   5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Can you please suggest 2 additional factors that contribute to organizational readiness for E-government diffusion and rate them?

[   ]

Political Readiness

Assess the political environment in which your organization operates for it readiness to support the diffusion of e-government

How would you rate Political Environment as Vital to successful diffusion of E-government in your Organization?

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

To what extend would you consider the following as contributing to Political Readiness?

National Resource Availability and Allocation from the Central Government

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

National E-leadership

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

Existence National E-government Strategy

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

Institution of Legal and Regulatory Framework

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

Institutions facilitating and coordinating E-government implementation

	0	1	2	3	4	5	
No Impact	○	○	○	○	○	○	Max Impact

Would you please suggest 2 factors that contribute to Political Readiness and Rate them?

[   ]

Stakeholder Readiness

Assesses the readiness of the parties your organization deals with in the performance of duties and delivery services to adopt e-government

How would you rate your Stakeholders' Readiness to adopt E-government as vital to the successful its diffusion?

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

To what Extend would the following factors contribute to Stakeholder Readiness?

Access to Telephone; Mobile or Fixed line

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Stakeholders' Access to Internet

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Stakeholders' Awareness

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Capacity for Utilization: literacy levels of individual users your services

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Institutional stakeholder's ability to adopt e-government

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Where Stakeholders could be compelled to adopt e-government

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Socio-Political Culture: Preference for Human Contact

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Stakeholders' perception of your organization as fair and transparent

0 1 2 3 4 5

No Impact ○ ○ ○ ○ ○ ○ Max Impact

Could you please suggest 2 factors that contribute to Stakeholder Readiness?

Would you please suggest other major factors that would contribute to your organizations E-readiness?

Background Information

Please, can you name the Ministry, Department or Agency do you work for?

Please, Could you indicate your Designation?

Please do you have Decentralized Offices and the Regions and Districts?

- ☐ Yes
- ☐ No

Submit

Appendix 2: Questionnaires for E-readiness Assessment: MMDA's

The Objective of this questionnaire is to help assess the E-readiness of Metropolitan, Municipal and District Administration as well as Ministries, Departments and Agencies to Use E-government as a tool for Decentralization. This is pure for Academic Research only, any information provided therefore would be confidential and solely for that purpose.

Which Ministry, Department or Agency do you work for?

> [ ]

What is your designation in the Ministry, Department or Agency?

> [ ]

Is your Ministry, Department or Agency decentralized to the regions and districts?

- [ ] Yes

- [ ] No

Technological Readiness

This Section Assess the Technological Readiness of your Organization to diffuse e-government.

Access to Telecommunication Infrastructure

0 is none while 5 is Maximum Score

How would you rate the access to fixed Telecommunication Infrastructure in your organization?

	0	1	2	3	4	5
—	○	○	○	○	○	○

How would you rate your level of access to wireless (Mobile) telecommunication Infrastructure?

	0	1	2	3	4	5
—	○	○	○	○	○	○

How would you rate the quality and reliability of this infrastructure?

	0	1	2	3	4	5
—	○	○	○	○	○	○

To what extend are the access to these services affordable?

0   1   2   3   4   5

○   ○   ○   ○   ○   ○

Internet Connectivity

0 means none while 5 is maximum score

How would you rate your organization's access to the Internet?

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How would you rate the Quality of your Internet Connectivity?

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How would you rate the reliability of your connectivity?

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How you rate the affordability of your Internet Connectivity

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

Web Presence

How would rate the website of your organization?

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

To what extend is official organizational email important to your organization

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How would you rate the importance or usefulness of your website to your organization?

  0   1   2   3   4   5

○   ○   ○   ○   ○   ○

To what extend do you utilize organizational email in dealing with your stakeholders?

  0   1   2   3   4   5

○ ○ ○ ○ ○ ○

Level of Automation

How would rate the computer to worker ratio in your organization

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend do you consider your organization networked?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend is data and information in your organization electronically stored?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extent would you consider the operations of your organization computerized?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend is both internal and external Communication and reports are sent and received electronically?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

Technical Expertise

How would you rate the ICT expertise for Technical support in your Organization?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend is it difficult to have access to technical support from outside your organization?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend is your organization considering training somebody for technical support ?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend is your organization making plans to recruit technical Personel?

	0	1	2	3	4	5
	○	○	○	○	○	○

Organizational Readiness

Assessing the structures put in place in your organization for the diffusion of e-government

Administrative Competence

To what extend are your staff and managers satisfied with the way your organization operates?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would you rate the qualification of the key staff of your organization for their assigned jobs?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend do you consider the staff of your organization competent in the position they hold?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would rate the level ICT literacy among the managers of your organization?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would you rate the competencies of staff to adopt ICT and E-government in your Organization?

	0	1	2	3	4	5
	○	○	○	○	○	○

E-Leadership

To what extend is the Head of your organization committed to e-government diffusion?

0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

How would you rate management commitment to computerization of your operation?

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

How would you rate the rank of Head of ICT in your organization?

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

To what extend do you have a top manager driving or advocating for E-government in your organization

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

Continue » Top of Form

Organizational Awareness and Culture

How would you rate the level of adoption of ICT in your operations?

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

How would you rate the awareness management of E-government developments?

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

To what extend would E-government improve the efficiency of your organization?

　0　　1　　2　　3　　4　　5

○　　○　　○　　○　　○　　○

To what extend is your organization being compelled to adopt ICT to satisfy stakeholders?

　0　　1　　2　　3　　4　　5

○ ○ ○ ○ ○ ○

E-Strategy

How would rate your organization's e-government strategy ?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend has your institutions identified services that can be done electronically?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend are you collaborating with regulatory institutions to diffuse e-government?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend have you identified the channels for E-governance and e-services delivery?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

Budget/ Resource Availability

How would you rate the availability of funds allocated for your e-Government plans

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend does the central government support your organizations e-strategy?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend are you supported with Technical personnel?

0   1   2   3   4   5

○ ○ ○ ○ ○ ○

To what extend is ICT given priority by your organization in resource allocation?

0   1   2   3   4   5

○   ○   ○   ○   ○   ○

Political Readiness

Assess the political environment of your organization for its readiness to support the diffusion of e-government

National Resource Allocation

To what extend do your organization depend on Central Government for e-government development?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How would you rate the Government support for e-government implementation in your organization?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

To what is your organization allocated adequate resource for e-government implementation?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

How would you rate the support of NITA and Ministry of Communication in your e-transformation?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

To what extend does inadequate resources negatively affect e-transformation of your organization?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

National E-leadership

How would you rate the government commitment to E –government implementation in your organization?

   0   1   2   3   4   5

○   ○   ○   ○   ○   ○

To what extend would consider National e-Leadership as important to your e-transformation?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

To what extend is National E-Leadership adequate for your organizations e-government drive?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

How do rate NITA and Ministry of Communication in the drive towards E-governance?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

To what extend is organization autonomous in deciding of e-government implementation?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

National E-strategy

How would you rate National E-government Strategy?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

How satisfied are you with the National E-government implementation process?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

How would you rate the importance of the National strategy to your organizational e-government plan?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

To what extend do you consider the National E-strategy as synchronized with your organization's reforms?

   0   1   2   3   4   5

   ○   ○   ○   ○   ○   ○

To what extend is the National e-strategy aligned with your organization plans?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

Legal and Regulatory Framework

To what extend are you familiar with the Legal, Institutional and legal framework for e-government implementation

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

How would you rate the relationship between your organization and the Institutes facilitating e-government (NITA)?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

To what extend would consider the institutional framework as facilitating e-government?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

To what extend do the existing legal framework in place to facilitate e-government?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

How would you rate the adequacy of the laws in place for e-government development?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

« Back   Continue »   Bottom of Form

Stakeholder Readiness: Access to Technology Infrastructure and Services

Assesses the readiness of the parties your organization deals with in the performance of duties and delivery services

To what extend do your stakeholders have access to telecom infrastructure?

```
0    1    2    3    4    5
```

○   ○   ○   ○   ○   ○

To what extend do your stakeholders have access to the internet ?

0	1	2	3	4	5
○	○	○	○	○	○

How would rate the quality of the internet connectivity of your stakeholder?

0	1	2	3	4	5
○	○	○	○	○	○

How would you rate the stakeholder's potential access to Telephone services?

0	1	2	3	4	5
○	○	○	○	○	○

How would rate your stakeholders access to ICT as affecting your plans for e-services delivery?

0	1	2	3	4	5
○	○	○	○	○	○

Stakeholder Awareness

To what extend would agree that you stakeholders are aware of your e-government strategy

0	1	2	3	4	5
○	○	○	○	○	○

How would rate your stockholders awareness of various channels for your e-government delivery?

0	1	2	3	4	5
○	○	○	○	○	○

How would you rate you stakeholders' awareness of the potential benefits of e-government?

0	1	2	3	4	5
○	○	○	○	○	○

To what extend could your stakeholders to cause the failure of your e-government initiative?

0	1	2	3	4	5
○	○	○	○	○	○

To what extend can your stakeholders be coerced into adopting e-government?

	0	1	2	3	4	5
	○	○	○	○	○	○

Capacity for Utilization

How would you rate the literacy levels of individual users your services?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend would rate the ability of your individual user to adopt E-governance?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would you rate your institutional stakeholder's ability to adopt e-government?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would you rate the affordability your e-government services to your current services?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend would your stakeholder capacity for utilization negatively affect your plans?

	0	1	2	3	4	5
	○	○	○	○	○	○

Socio-Political Culture

To what extend do your stakeholders perceive your organization as fair and transparent?

	0	1	2	3	4	5
	○	○	○	○	○	○

How would rate your stakeholders preference for human contact

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend would say your services can be influenced by other considerations?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend does your organization require the presence of a stakeholder before services can be performed?

	0	1	2	3	4	5
	○	○	○	○	○	○

To what extend does your organization follow standard stakeholder turnover time?

	0	1	2	3	4	5
	○	○	○	○	○	○

« Back   Submit

Appendix III: Qualitative Questionnaire: E-Government in Local Government

Preliminary Study: E-government Implementation Status in MMDAs

Declaration- *The objective of the questionnaire is to assess the E-readiness of Metropolitan, Municipal, Districts and Departments for the E-governance as a tool for decentralisation. This is for the purpose of an academic research only, therefore any information given would be treated confidential and for that purpose only:* **Respondents**–*To be filled by Head of Department or IT Officer of the Department or equivalent as would be designated by the Head of Department.*

1. **Contact Details**

Name of Department		
Contact Details	Name of Contact Person	
	Designation	
	Website	
	E-mail	
	Location (District and Region)	

Name of Metropolitan/municipal/District		
Contact Details	Name of Contact Person	
	Designation	
	Website	
	E-mail	
	Location (Region)	

I. Current state of Information technology (IT) Infrastructure in Organization/ Department/District-

How would you categorize the Departments' IT infrastructure capabilities *(Please tick the applicable circle)?*

No computers

Few standalone computers used for word processing

Few networked computers used only printer sharing

Few networked computers used only for email and maybe MIS

Fully networked department with applications on central server in departmental data center

Fully networked department with applications on central server in state data center

What is the IT penetration Ratio of the Department?

(IT Penetration Ratio = Total number of computers/ Total Number of Employees)

Total No. of Computers	
Total No. of Employees (Clerks and Above)	
IT penetration Ratio	

3. Does the Department have its own automated Management Information System (MIS)?

Yes   No

Does the department have internet access?

Yes   No

Does the department have a website

Yes   No   268

Is the department linked to a National website

Yes   No   ☐   ☐

Does the Organization have Institutional email Systems

Yes   No   ☐   ☐

What are the allocated IT budgets for the Department over last 3 years?

Budget Period	Allocated Budget (GHC).	Actual IT Expenditure in (GHC)	Area-wise IT expenditure (E.g. Hardware procurement, Application development etc.)
2009			
2010			
Current year			

Has the allocated IT budget been fully utilized to your satisfaction, if no, then why?

 _____

 _____

 _____

Is there an IT Department in your organization?

Yes

No

How many IT trained staff (in numbers) are there in the Department under the following categories? (In-house means staff employed in the department)

Category	Number of trained IT staff (In-House)	Number of trained IT Staff (Outsourced)
Only Basic Computer *Email/ Word Users*		

Advanced Computer Software Users		
IT Project Managers		
Database Administrators		
Software/ Application Developers		
Network Administrators		
Helpdesk/ Desktop Management		
Website Management		

Is the management of the IT infrastructure of the Department outsourced to a third party?

Yes

No

Partly

If Yes, Please provide the following details:

Function	In-House	Outsourced
Application Development		
Application Maintenance		
Database Administration		
Helpdesk and support services		
Network Management		
Website Services		

Does the Department maintain database of citizens in any form?

Yes

No

Partly

In what form is the Data maintained?

Paper

Electronic/digital

Both

How is Data Maintained in this organization? through

Standard Database Management Systems on standalone computer

Connected computers with shared database

Maintained on standalone computers with no standard Database Management System

How is the Data communicated?

Intranet

Printout

LAN

What is the list of major Software applications being used by the Department with modules?
Also provide details of the Operating system and application and db platforms on which these
applications are running. Categorize them as Central/ State/ Department/ Standalone.

No.	Application Name	Application Function	No of Users	No of physical Locations of application usage (e.g. 5 Buildings)	Type of access (LAN, Web based, Dial-up, Leased Line)	Type (Centralized / de-centralized Standalone)

)						
;						

Does the Department conduct its IT training sessions for the employees?

Yes

No

If Yes which of the following areas have they been trained who sponsored the training where applicable.

e of Institute	Name of the Institute		
	Basic IT skill set	Departmental Application Training	IT Management Trainin
vate Training Institute			
partment Training cilities			
ate recommended aining Facilities			
nistry of Communication			
ne			

Are there any guidelines issued by the IT department with regard to individual IT architectures of departments that they need to conform to? If YES, then please provide the copy of the guidelines.

Yes

No

What role does your HQ and Ministry of Communication, District/Municipal/Metropolitan Assembly play in the Departments' IT operations? List the functions –

NITA:

_____

_____

Department of IT:

_____

_____

What are the expectations from National HQ and Ministry of Communication to improve delivery of IT services?

HQ:

_____

_____

Ministry/Government:

_____

_____

How often are the websites of the departments being updated?

_____

_____

What are the existing bottlenecks in ensuring timely updating of the website?

_____

_____

II. Current level of <u>E-governance</u> of the Department

1. **List the current Computerization and E-Government Initiatives of the Department and the function it performs? What is the service delivery channel (Kiosk/ Intermediary/ Internet/ Telephone) of this E-Government initiative?**

Initiative *(Example – Online Registration)*	Channel (Internet)

8. Has your department implement, Planning to Implement or No plan on the Following

unction	Accepts	Plan to	Non
ectronic Payment			
ectronic Notifications			
ectronic Document Exchanging			
ectronic Transaction			
ability Assignment for Electronic Transaction			
onnect to Internet			
velop a Website			

2. **What services of the department could be bought under the purview of E-Government?**

   _____

   _____

3. **Are there any E-governance initiatives that are currently being planned?**
   a.   Yes
   b.   No

   If YES then, list the initiatives -

_____
_____

4. **How would e-government be beneficial to your institution?**

5. **What is the approval process for E-governance initiatives of the department?**

_____

_____

_____

6. **Are there any IT Security or Disaster Recovery/ Business Continuity Policy of the Department? If YES, then please provide the copy of the policies.**
   c. Yes
   d. No

7. *WHAT are the existing Hindrances in implementing IT/ E-governance initiatives in your District/Municipality/department?*

8. **Internal to the department –**

Problems	Strongly Agree	Agree	Disagree	Strongly Disagree
Lack of adequate Manpower				
Lack of Departmental Policies on E-governance				
Strict Dependency on the National HQ				
Budgetary Allocation				
Lack of awareness of E-governance policies the department				
Lack of ICT Infrastructure				
Problems with project approval				
Corruption				

9. **External to the department –**

Problems	Strongly Agree	Agree	Disagree	Strongly Disagree
Lack of Funding from Government				
Lack of Government Policies				
Lack of Connectivity Infrastructure				

	Lack of Direction from the Central Government				
	Lack of Demand/supply Mismatch				
	Lack of Relationship with Other departments				
	Lack of Illiteracy				
	Lack of Political Will				
	Lack of Corruption				

Appendix IV: Inter-Item Correlation Matrix of the Predictor Variables

Table 0-1: Inter-Item Correlation Matrix

Inter-Item Correlation Matrix							
	T1	T2	T3	T4	T5	TR	O1	O2
T1	**1.000**	**.607**	**.470**	**.356**	**.457**	**.745**	.240	.110
T2	**.607**	**1.000**	**.495**	**.371**	**.480**	**.741**	.181	.340
T3	**.470**	**.495**	**1.000**	**.400**	**.707**	**.793**	.222	.117
T4	**.356**	**.371**	**.400**	**1.000**	**.577**	**.731**	.376	.229
T5	**.457**	**.480**	**.707**	**.577**	**1.000**	**.838**	.233	.281
TR	**.745**	**.741**	**.793**	**.731**	**.838**	**1.000**	.335	.274
O1	.240	.181	.222	.376	.233	.335	**1.000**	**.504**
O2	.110	.340	.117	.229	.281	.274	**.504**	**1.000**
O3	.258	.204	.244	.460	.347	.405	**.564**	**.562**
O4	.167	.171	.201	.469	.232	.336	**.396**	**.544**
O5	-.018	.129	.177	.356	.137	.213	**.562**	**.537**
OR	.219	.321	.189	.446	.287	.386	**.766**	**.811**
P1	-.264	-.191	.012	.008	-.052	-.119	.347	.129
P2	-.128	-.229	-.077	.085	-.111	-.105	.179	.168
P3	-.242	-.231	-.041	.074	.053	-.089	.107	.210
P4	-.078	-.166	.112	.105	.175	.049	.086	.020
P5	-.232	-.152	-.055	.069	.019	-.084	.000	.240
PR	-.228	-.238	-.009	.087	.028	-.081	.167	.188
S1	-.168	.008	.008	.082	.101	.009	.113	.321
S2	-.022	-.024	.041	-.117	-.014	-.040	-.167	.001
S3	-.128	-.047	.110	-.164	.005	-.065	-.245	.058
S4	-.241	-.191	.059	-.159	-.070	-.157	-.034	.104
S5	-.295	-.160	-.064	-.117	-.078	-.186	-.063	.024
SR	-.229	-.109	.035	-.118	-.014	-.115	-.094	.137

Inter-Item Correlation Matrix							
	O3	O4	O5	OR	P1	P2	P3	P4
T1	.258	.167	-.018	.219	-.264	-.128	-.242	-.078
T2	.204	.171	.129	.321	-.191	-.229	-.231	-.166
T3	.244	.201	.177	.189	.012	-.077	-.041	.112
T4	.460	.469	.356	.446	.008	.085	.074	.105
T5	.347	.232	.137	.287	-.052	-.111	.053	.175
TR	.405	.336	.213	.386	-.119	-.105	-.089	.049
O1	**.564**	**.396**	**.562**	**.766**	.347	.179	.107	.086
O2	**.562**	**.544**	**.537**	**.811**	.129	.168	.210	.020
O3	**1.000**	**.543**	**.584**	**.837**	.111	.033	.099	.046
O4	**.543**	**1.000**	**.523**	**.650**	.287	.163	.072	.150
O5	**.584**	**.523**	**1.000**	**.701**	.367	.309	.233	.172

OR	**.837**	**.650**	**.701**	**1.000**	.231	.187	.194	.053
P1	.111	.287	.367	.231	**1.000**	**.533**	**.413**	**.407**
P2	.033	.163	.309	.187	**.533**	**1.000**	**.676**	**.453**
P3	.099	.072	.233	.194	**.413**	**.676**	**1.000**	**.529**
P4	.046	.150	.172	.053	**.407**	**.453**	**.529**	**1.000**
P5	.001	.141	.300	.142	**.392**	**.687**	**.699**	**.743**
PR	.068	.199	.338	.193	**.661**	**.828**	**.821**	**.802**
S1	.154	.195	.264	.268	.077	.056	.022	.074
S2	-.081	-.124	-.076	-.020	-.090	.088	.172	.084
S3	-.193	-.016	-.116	-.120	.068	.062	.278	.265
S4	.026	-.016	.052	.055	.201	.159	.313	.206
S5	-.140	-.213	-.088	-.042	.008	.100	.246	.061
SR	-.057	-.045	.015	.043	.069	.121	.264	.174

Inter-Item Correlation Matrix							
	P5	PR	S1	S2	S3	S4	S5	SR
T1	-.232	-.228	-.168	-.022	-.128	-.241	-.295	-.229
T2	-.152	-.238	.008	-.024	-.047	-.191	-.160	-.109
T3	-.055	-.009	.008	.041	.110	.059	-.064	.035
T4	.069	.087	.082	-.117	-.164	-.159	-.117	-.118
T5	.019	.028	.101	-.014	.005	-.070	-.078	-.014
TR	-.084	-.081	.009	-.040	-.065	-.157	-.186	-.115
O1	.000	.167	.113	-.167	-.245	-.034	-.063	-.094
O2	.240	.188	.321	.001	.058	.104	.024	.137
O3	.001	.068	.154	-.081	-.193	.026	-.140	-.057
O4	.141	.199	.195	-.124	-.016	-.016	-.213	-.045
O5	.300	.338	.264	-.076	-.116	.052	-.088	.015
OR	.142	.193	.268	-.020	-.120	.055	-.042	.043
P1	**.392**	**.661**	.077	-.090	.068	.201	.008	.069
P2	**.687**	**.828**	.056	.088	.062	.159	.100	.121
P3	**.699**	**.821**	.022	.172	.278	.313	.246	.264
P4	**.743**	**.802**	.074	.084	.265	.206	.061	.174
P5	**1.000**	**.892**	.156	.216	.310	.213	.171	.273
PR	**.892**	**1.000**	.098	.124	.252	.269	.146	.227
S1	.156	.098	**1.000**	**.371**	**.385**	**.325**	**.313**	**.633**
S2	.216	.124	**.371**	**1.000**	**.650**	**.404**	**.556**	**.763**
S3	.310	.252	**.385**	**.650**	**1.000**	**.633**	**.624**	**.844**
S4	.213	.269	**.325**	**.404**	**.633**	**1.000**	**.677**	**.786**
S5	.171	.146	**.313**	**.556**	**.624**	**.677**	**1.000**	**.830**
SR	.273	.227	**.633**	**.763**	**.844**	**.786**	**.830**	**1.000**