ANALYZING E-GOVERNMENT IN DEVELOPING COUNTRIES USING A STAGES MODEL APPROACH: A CASE STUDY

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Abstract

ANALYZING E-GOVERNMENT IN DEVELOPING COUNTRIES USING A STAGES MODEL APPROACH: A CASE STUDY

This dissertation undertakes an evaluation of electronic government in a developing country using a Stages Model approach. The intellectual traditions of communication for development and technological determinism perspectives are employed to assess the implementation of e-government, a transformational resource for the advancement of government-citizen relations made possible by advances in information and communication technologies that have gained prominence in the last two decades. Governments around the world have adopted the use of information and communication technologies as a means of transforming the delivery of services and access to information for citizens. Electronic government, the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of government, has become a critical tool toward this end. However, the progress and outcomes of the implementation of e-government in developing countries has not been adequately studied.

This study uses content analysis to examine websites established by Kenya government's 46 ministries in Kenya and evaluates their performance using a four-stage model framework. The framework builds on existing e-government literature and utilizes 35 different content measures to evaluate information content, transaction, horizontal integration and vertical integration attributes of government ministry websites. The research was conducted between June and July of 2009. The content coding instrument used in the study is the Web Attribute Evaluation System developed by the Cyberspace

Policy Research Group. The study reviews relevant e-government literature for evaluating Web sites worldwide, discusses sample selection, methodology, theoretical framework, findings, and recommendations.

The content and attributes of ministry websites are compared across different e-government stages and ministries grouped into functional categories. The central analysis of these data is to evaluate the claim that access to information and transaction attributes provided by e-government will improve the relations between government and citizens by enhancing the quality and convenience of services delivery. This dissertation puts forth two major findings: that government ministries have adopted online communication as one of the main resources for delivery of services, achieved by posting online some level of information, enabling communication and interaction online, and are at varying stages of e-government development. Secondly, the dataset confirmed the Layne and Lee Stages model prediction that e-government tended to grow progressively from the information (Catalogue) Stage towards higher Stages. The study showed higher scores at the Catalogue stage for all ministries than at all the other stages.

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Chapter 1: Introduction

1.1: Introduction

One of the research questions being studied across many disciplines is how new information and communication technologies (ICTs) are creating social change. Central to this question is how the Internet contributes to social change at the individual, institutional and societal level. In government, the introduction and spread of electronic government (e-government)[1] is seen widely as a major step in transforming the relationship between government and citizens. By enabling changes that lead to greater efficiency, access to information and better service delivery, electronic government will contribute to greater citizen participation in government and greater accountability and transparency in the decisions and actions of government.

As governments worldwide adopt the usage of electronic information technology based systems, their applications and types of uses are proliferating. These advanced information and communication technologies increasingly replace and/or change traditional methods of government information and services delivery. This has led to suggestions that information technology innovation is a panacea for government transformation. Scholars have developed a consensus that ICTs, in general, the Internet and electronic government in varying applications, have the potential to change and improve many aspects of life in society and in organizations. In particular, there are a number of claims that e-government improves the way government communicates and relates to citizens.

[1] See Definition of Terms

Electronic government, defined as the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, business and agencies (Carter and Belanger, 2005), has been adopted by governments around the world as new technological developments and digitalization allow easier production, transmission and exchange of information in real time. The World Bank defines e-government by listing its benefits as follows,

> the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.[2]

A number of perspectives are found in the literature about the adoption of e-government. Researchers focus their studies on a number of different aspects of e-government (Reece, 2006, Heeks and Bailur, 2007; Carter and Belanger, 2005; Wong and Welch; 2004Chadwick and May, 2003; Welch et.al, 2004; Coursey and Norris, 2008). Studies across various disciplines make present varying perspectives about information technology and society, the Internet and social change, technology and institutional

[2] The World Bank, What is Governance?, http://www1.worldbank.org/mena/governance

transformation. These perspectives represent a variety of views about research on electronic communication, in general, and e-government in particular. Optimists claim that e-government leads to citizen empowerment through improvement of government relations with citizens (Kumar and Best, 2006). Others support claims that e-government has a major role in the transformation and improvement of public sector operations (Welch et.al, 2004), enhancing government accountability (La Porte, de Jong, 2000; Demchak, 2000; Demchak, Friis, and La Porte, 2000), greater efficiency in service delivery, access of information for citizens (West, 2004; Pina et. al., 2007), and opportunities for cross collaboration and information resource sharing between government agencies, businesses, citizens and other stakeholders (Silcock, 2001). It is widely believed that ". . . the use of information and communication technologies to improve the efficiency, effectiveness, transparency, and accountability of government" (WB)[3] is an essential innovation for the transformation of government services and the improvement of communication between governments and their various constituencies.

In many studies the use of electronic technology is associated with the enhancement of access to information and delivery of government services to citizens, business partners and employees. In broader terms, these benefits are seen to have the impact of positive social change (Silcock, 2001).

Some researchers suggest specific transformational changes associated with the introduction of e-government. Cook's (2000) discussion highlighted e-government's four dimensions in relation to major functions and activities of governments, and these are: e-services (delivery of government information electronically), e-management (use of ICTs

[3] World Bank…2005

to improve management and communication within and outside government structures), e-democracy (use of ICTs to enhance citizen participation in democratic activities), and e-commerce (online transaction of goods and services).

Assumptions and claims about the contribution of electronic government in restructuring service delivery by public agencies at different levels are varied across studies. Scholars do not fully agree on the nature, extent and significance of the changes brought about by e-government. Some studies argue that e-government reproduces patterns of the same communication process associated with conventional practices in the traditional bureaucratic system (Information Society Commission, 2003). Others have argued that electronic communication opens up more channels of communication and gives citizens greater access to government officials than was possible with the communication methods under traditional bureaucratic systems (Coursey and Norris, 2007).

Studies that address advantages associated with the establishment of e-government identify advantages such as facilitating general compliance, citizen access and participation and services integration (Zhiyuan, 2002). According to some recent studies, interactive government websites encourage greater citizen participation in decision-making (Carter and Belanger, 2005), increase citizen satisfaction and trust in government, and increase levels of accountability by government agencies (Wong and Welch, 2004). Government websites can also foster cross-agency collaboration. Zhiyuan (2002) outlined a number of e-government collaboration models which include government-to-citizen (G2C), government-to-business (G2B), government-to-

government (G2G) and government-to-employee (G2E) interaction models. Other studies conclude that citizens become more engaged in decision-making by government, gain access to more information about the performance of governments, and develop stronger relationships with governments, and gain trust governments more (Basu, 2004).

The study of the impact of the Internet as an information and communication tool for social change in developing countries is influenced by the theory of modernization and technological determinism (among other perspectives). Mass communication approaches to the study of the role of the media in developing countries often follows the modernization paradigm, commonly referred to as the dominant paradigm which gained prominence in the 1950s (Roman, 2005). Proponents of modernization theory hypothesized a direct relationship between mass communication and the process of changing traditional societies to modern ones. The dissemination of developmental information, mostly following the model of western industrial countries, was expected to have the effect of transforming traditional societies into modern ones (Schech 2002). Lerner (1958) suggested that exposure to national and international media eased the transition for Middle Eastern populations from traditional to modern societies. Studies by Schramm (1964) saw the media as a way of expanding the horizons of traditional societies while Pye (1970) saw a role for communications in the political development of new countries.

While modernization theory has been discredited in recent times, the idea of communication as integral to development has remained a crucial model for studying developing countries. Studies of the impact of the Internet, therefore, are based on the

underlying the communication for development discourse. Schech (2002) suggested that modernization discourse and communication for development perspective are tied to the uses of ICTs for communication to bring about social change in developing countries. Roman (2005) in a discussion of the role of theory in development communication suggested that there is a relationship between communication and development and a role for ICTs or new media in developing countries.

The technological determinist view is a technology-led theory of social change: technology is seen as causal factor of change. According to technological determinists, communications technologies or the media, or technology in general are the major causes of changes in society, and technology is seen as an important factor underlying the pattern of social organization.

Technological determinists interpret technology, in general and communications technologies in particular, as the basis of changes in society. New technologies, according to this view, transform society at every level, including institutions, social interaction and individuals. Technological determinism focuses on cause and effect relationships which makes it an explanatory and predictive theory. Deterministic perspectives have been common in studies on communication technologies (Fairchild and Quansah, 2007). Theorists have argued that changes brought about by communication technologies, such as e-government, have an important impact, and these theorists regard such changes as capable of transforming society and its institutions (Heeks and Bailur, 2007).

Many studies of mass communication in Africa have addressed the role of communication media in development and social change. The ICT-for-development discourse has encouraged many developing countries' governments to formulate and implement ICT-centered plans, beginning with e-government, as part of their development strategies. The assumption (based on the modernization discourse) that technological advancement will result in social change is common in mass communication research on social change in developing countries (Howcroft, 1999). Howard (2007) referred to this as the "leapfrog" hypothesis, meaning that the opportunity exists for developing countries to harness ICTs for development thus, bypassing the common obstacles to development.

By enabling government to provide greater access to information and effective delivery of services for their citizens, ICTs, the literature suggests, create competitive economic environments, and enhance the quality and levels of services in a nation (Meso et. al, 2004). More importantly, e-government is expected to enhance citizen awareness and knowledge, resulting in higher participation in governance. The concept of governance has a direct relationship to national development because it deals with the way a country manages its resources for development (Howard, 2007). The level of development of communication in a country can significantly impact change, and, as studies in developing countries have found (Schech, 2002; Meso et. al, 2006; Basu, 2004), good governance and socio-economic performance have a direct relationship with access to information.

Heeks (2007) reviewed frameworks for understanding perspectives on causes and impacts associated with e-government adoption that can be applied to evaluating change in public agencies, or can be used to analyze e-government's impact on government-citizen interactions. These perspectives are technological determinism and social determinism. Technological determinism suggests that technology determines the potential impacts of introducing information and communication technologies. Social determinism, on the other hand, considers human choices within social structures as being important determinants of impacts of uses of information technologies. Both frameworks, according to Heeks (2007), can be used to understand different positions on information technology and government.

Different approaches have been used to evaluate e-government as countries around the world continue to implement it. Some studies use e-government readiness framework, others focus on the web presence of government and others focus on web content attributes. The Stages model-based approach to the study of e-government studies is frequently used for evaluating e-government development at country, state, local and city levels of governments. The Stages model approach involves the assessment of different phase of growth of government websites. It assumes that as government websites grow from one stage to another it improves in terms of its capacity to deliver more services to citizens. Versions of the Stages models vary in terms of the number of stages identified in different studies, with some suggesting four, five or even more stages that broadly, include information, interaction, transaction, and transformation stages (Coursey and Norris, 2008). The models give some insights into Stages of growth of e-

government. These Stages of growth of e-government can be analyzed from different theoretical perspectives that might offer insights on changes associated with e-government.

Coursey and Norris (2008) present a summary description of the Stages model approach to the evaluation of e-government. According to their study, e-government evolves in several distinct Stages that reflect changes in its development and these stages can be used to measure progress. These Stages delineate where different government and specific agencies are on the road to transformation (Jae Moon 2002; the UK National Audit Office, 2002); the UN/ASPA, 2002; Santos and Heeks 2003; Layne and Lee 2001; and West, 2004).

The Stages of e-government, in some variations of the model, include but are not limited to: (1) the billboard (information) stage; (2) the partial service delivery (interaction) stage; (3) the portal stage (transaction) with fully executable and integrated service delivery; (4) the seamless (transformation) stage with full integration of e-services across administrative boundaries; and (5) the interactive (e-governance) democracy stage.

As described by Coursey and Norris (2008), Stage 1 (in most studies), is the most basic form of e-government and simply disseminates information by posting information on Web sites. Stage 2 involves a two-way communication and, at this stage, governments incorporate e-mail systems as well as information and data-transfer technologies. In Stage 3, governments allow online services and financial transactions by gradually phasing out direct services by public officials. In Stage 4, governments attempt to integrate various

government services vertically and horizontally. Stage 5 involves the promotion of web-based political participation in which government websites include e-governance tools such as e-democracy.

Overall, the models predict that e-government will move beyond information provision and interactivity to become fully transactional. They also predict that e-government will fundamentally transform the relationship between governments and their citizens. The models become normative when they describe fully developed e-governments, and assert what e-governments should become. The models implicitly presume that fully transactional systems are better and that more citizen interaction equals improved service.

These models are partly descriptive, partly predictive, and partly normative (Reece, 2006; Coursey and Norris, 2008). They predict that governments will move stepwise toward the adoption of more sophisticated e-government services, from information, transactions and integration, ultimately to transformation (Coursey and Norris, 2008).

Since the introduction of e-government technology, researchers and scholars have discussed its possible impact on the transformation of the functioning of government and the impact on the relationship between citizens and governments (e.g. Reece, 2006; Heeks and Bailur, 2007; Siau and Long, 2005; Basu, 2004; West, 2004). In recent years, researchers have increasingly focused their attention on the attributes of government websites and the features that support their claims about the effect on government-citizen relationships

A number of arguments have been made with regard to attributes of government websites. Leith and Morison (2004) have described websites as the public face of governments because communication is central to dialogue between governments and citizens. Some scholars argue that government websites play a key role in this relationship by offering access to information about government agencies that citizens did not previously have. This makes governments more transparent (Short, 2007). Others suggest that because of their interactive features, government websites offer citizens opportunities to engage in dialogue with government officials, thus improving public officials' accountability and increasing trust between governments and citizens (Welch et.al., 2004; Carter and Belanger, 2004; Pina et. al., 2007; West, 2004; Chadwick and May, 2003).

According to these views, e-government eliminates barriers between government and citizens that otherwise impede government-citizen relations. Skeptics argue that e-government reproduces the same bureaucratic structures as found in traditional forms of government. Wong & Welch (2004) argued that information technology in public organizations simply improved their technical efficiency without leading to significant organizational changes. Instead, information technology tended to reinforce existing practices in organizations. This means that e-government might exacerbate the existing problems and attributes of public bureaucracies. E-government accountability, they argued, is more related to bureaucratic styles than to technology per se. According to Chadwick and May (2003), e-government managerialism will tend to emphasize efficient delivery of information to citizens, improvement of information flows across government

agencies, and better delivery of services. Further, they suggest that institutions of governance determine the adoption of e-government and shape its development. These institutions are embedded within historical and ideological contexts with pre-existing biases and constraints. Technology, according to this argument, is a facilitating actor that interacts with existing historical, organizational, and environmental pressures to shape potential changes. Chadwick and May (2003) found that specific uses of information technology conform to specific forms of government. For example, data transformation technologies such as mainframes and databases are compatible with managerial democracies while mass participation technologies such as opinion polling and interactive cable TV are suited to populist democracies and interactive technologies fit with pluralist models of democracy. These arguments reflect the social constructivist perspective that suggests that human agency is a key influence shaping the use of information technology in the public sector (Heeks & Bailur, 2007).

A central argument in this study is that the impact of e-government on government-citizen interactions is influenced by a combination of factors. The attributes of government websites are key to their usability. It is therefore necessary to examine these web attributes as means to confirm claims and predictions about social change. Further, this study argues that while the necessary conditions for the effective implementation and utilization of e-government are not readily available in developing countries, the rapid proliferation and status of government websites, as currently developed are significant but have not been subjected to direct and critical empirical observation.

The increasingly widespread adoption of e-government has led to many speculations about the nature, significance and impact of this trend. However, it is evident that its adoption and use is varied from one government to the next and success is dependent upon factors beyond technological innovation. Factors such as a country's level of communication infrastructure, a government's commitment to developing e-government, and the degree of citizen access to information technology services lead to differences in the patterns of e-government development from country to country. The extent to which the establishment of e-government websites will lead to changes in the relationships between governments and citizens, in service delivery and the transformation of government especially in resource-challenged developing countries where access issues are critical, will vary based on each country's peculiar conditions and contexts.

Whether e-government increases access to information and encourages greater citizen participation could have enormous impacts for poor countries with underdeveloped institutions (Meso et. al., 2004; Basu, 2004; Kumar and Best, 2006; Putnam, 1995). Howard (2007) concluded, in a study that tested the 'leap-frog' hypothesis (that ICTs would enable developing countries to make the hitherto elusive socio-economic progress), that economic wealth, democratic policy-making, and privatized infrastructure were essential for a country to leap forward.

Research on e-government impact in less developed countries is still scarce compared to research on developed countries. Much discussion in academic literature about the impact of e-government in transforming relations between government and

citizens, businesses, and other arms of government draw on experiences from developed western countries (Dada, 2006).

Although e-government technologies have potential to improve the lives of people living in developing countries, so far developed countries such as the U.S., Canada, the U.K., and Sweden are getting the most benefits from the implementation of e-government (Chen, Y. N. et.al, 2006). The gap between developed and developing countries in ICT infrastructures, practices, and usage remains wide. Among other challenges, developing countries lack capital to build up national information infrastructures on which e-government is based, and, the knowledge and skills with which to develop suitable and effective strategies for establishing and promoting e-government is also lacking.

Opinions vary with respect to the outcomes that can be expected from e-government in developing countries. Some experts believe that e-government is going to revolutionize public sectors and political processes worldwide, and in particular, give developing countries a chance to "leapfrog" their way towards good governance (Hammond, 2001; Howard, 2007; Mowlana, 2001).

The predictions of change due to the adoption of e-government in developing countries are unsubstantiated and there is a need for empirical work. While studies show that transparency and interactivity of government websites encourage openness and lead to better service delivery and greater citizen participation (Welch et. al., 2004; Carter and Belanger, 2005; Meso et. al., 2006; Choudrie and Gheorghita, 2005; OECD, 2005), these claims have yet to be examined with respect to their application in developing countries.

In particular, it is necessary to examine the claims that government websites provide citizens with opportunities to interact with their governments and access services and information that have not been possible in traditional forms of government-citizen communication. Developing countries are challenged by factors such as the digital divide between those with access and those lacking access to the Internet. This renders e-government inaccessible to many citizens and, therefore, not as effective in transforming citizen interactions and relationships (Howard, 2007). Norris's (2000) study of the digital divide showed how citizens' lack of access to the Internet decreased the significance of e-government in transforming the relationship between government and citizens. Other studies have shown that since the introduction of e-government, websites established by governments have remained at the information bill-board stage and have not contributed to greater access to information nor to better communication between government and citizens. A key argument in these discussions is that changes in the relationship between government and citizens supported by web-based communication require dynamic improvements to the features of government websites.

Research on e-government has focused, in recent years, on the intersection between government, information and communication technologies and their impact on society. E-government research has generated multidisciplinary studies to investigate and explain government transformation using approaches in various social science fields such as public administration and computer and information sciences. Studies have been done at global, regional and country levels to benchmark practices, compare experiences, and identify best practices. Notable among these are the benchmark studies sponsored by

such transnational bodies as the U.N., the World Bank, the European Union, the International Telecommunications Union, government entities, universities, private enterprises, the E.U. and country governments.

Since 1996, the Cyberspace Policy Research Group (CyPRG), the source of data for this study, studied the diffusion and use of the World Wide Web by governments worldwide, particularly in terms of organizational openness and internal effectiveness. The CyPRG website provides information and research resources such as a detailed explanation of the Website Attribute Evaluation System (WAES) which was developed in 1997, web content coding, updates on new and existing national Web sites, and sample interview guidelines.[4] From 1997 to 2000, the CyPRG, with funding from the US National Science Foundation, collected data on organizational transparency, openness, and effectiveness in 192 governments across the globe.

The assumptions and predictions about the contribution of electronic government in restructuring service delivery by public agencies are challenged by considerations such as public organizations' commitment and capacity to apply information technologies to transform government. On the other hand, the expectation that users of government services will adapt to information technologies as an innovation promising more efficient delivery of services and interaction with government agencies has yet to be systematically investigated, especially in developing countries.

The challenges to studying electronic government in developing countries, for example, include digital inequalities, lack of basic infrastructure, and a lack of access to

[4] See: http://www.cyprg.arizona.edu/index.html

information technologies, poor distribution and slow growth of its public use. There does not yet exist in developing countries a climate for the economic application of ICTs, and this poses another major challenge to studying e-government in these countries. In contrast, ICTs have been implemented and integrated into the economic domain in developed countries. Developing nations are slow in adopting new technologies and, coupled with this fact, citizens take a long time to embrace the benefits of these technologies because of scarce resources and competing economic priorities. It has been suggested that socio-economic factors have a major influence on the implementation of e-government.

Empirical studies might easily be undertaken in developed countries with a focus on a broad range of factors such as audience (user) variables, information dissemination and liberalization, and institutional change as a result of electronic government. These variables have not been adequately observed in developing countries and this limits the empirical study of the Internet, information technology use, and e-government in developing countries. This raises the important question about the generalizability of findings from studies of information technology in developed countries. How, for instance, can we study user perceptions of the benefits of the Internet in low income countries where the cost of accessing the Internet is prohibitive?

In recent years, a number of researchers have evaluated the status of e-government implementation, the potential for citizen empowerment through online access to government information and services, and the general improvement of government performance using ICTs (Schech, 2002; Howard, 2007, Meso et. al., 2006). However,

most empirical studies have concentrated on western countries (La Porte. 2002), and a few studies have focused on Asian countries (Holliday, 2002).

Clearly different social, cultural, political and economic conditions affect the adoption and implementation of e-government programs in different countries. The experience of African countries in the adoption and implementation of e-government remains largely unexplored. Studies that have been conducted have focused mostly on the diffusion of ICT's, the implications of the North-South digital divide, the socio-economic conditions that affect ICT development in Africa, and the technological infrastructure challenges these countries face. The actual experiences in the implementation and use of e-government for improving citizen participation in government have not been studied in developing countries.

African countries are at an early stage in the implementation of e-government (Salter, 2003) and are still far behind in adopting e-government development. Kenya, like other African countries, has created government agency websites. The creation of government websites is seen generally as a first step towards implementing full e-government strategies (Layne and Lee, 2001; Netchaeva, 2002; Silcock, 2001). To date, no systematic study has been done to examine the adoption and status of e-government, government websites, or implementation strategies in African countries as a whole or, more specifically, in Kenya, the focus of this study. Some studies have described the implementation of e-government around the world (La Porte et. al., 1999) without undertaking an in-depth look at the experience and the dynamics affecting the progress neither in adopting e-government nor in examining the factors affecting the realization of

the positive impacts of e-government. No studies about the experiences and progress in adopting e-government in Kenya (with specific attention to the website of government ministries) have been completed to this date.

1.2: Purpose of the Study

This study examines the adoption of e-government by public organizations in Kenya. Specifically, it examines websites established by government agencies, as a means of assessing the introduction of e-government. To do this, the study investigates the attributes of government websites, such as the status of availability of and access to information by citizens, the communication features that allow various forms of government-citizen interactions and the extent of transformation of service-delivery through vertical and horizontal integration evident on each website. Measures developed by CyPRG to monitor the effects of the Web on the operations of government agencies worldwide (La Porte, et. al, 1999) assess website content in this study. The content analysis tool developed by the group, the Website Attribute Evaluation System (WAES), measures website attributes, mainly, interactivity, transparency and openness. In this study, the coding criteria are derived from measures developed in this codebook. The study used the e-government Stages model as a conceptual framework to evaluate and describe e-government development in Kenya as a case study for developing countries' implementation of e-government.

1.3: Research Questions

Drawing on the stages models approach to the study of e-government, this paper evaluates the state of e-government in Kenya. The study examined the attributes of

government websites as indicators of the transformation of government services through e-government. The study examines and describes the information and e-government services offered to citizens of Kenya's government websites.

This study is a contribution to the research in e-government among developing countries, in general, and specifically in Africa. Through a description of government websites and examination of relevant explanatory factors, the study aims to contribute to a greater understanding of the impact of electronic government, and information and communication technologies on social change in developing countries. Thus this paper seeks to explore attributes of Kenya's governmental public agency websites by addressing the following research questions:

RQ 1: Using the Layne and Lee Stages model as a framework, are some types of ministries advancing faster than others through the Stages of e-government development based on their types of functions and services?

RQ 2: Do Kenya's governmental ministries' websites develop according to the sequence predicted by the Layne and Lee Stages model for e-government development?

These two broad research questions help address the wider implications of e-government in developing countries, including how e-government has developed in Kenya, the pattern of Stages growth based on the predictions of the Layne and Lee (2001) Stages model, are whether content and functionalities in Kenya's governmental websites contribute to information empowerment, transparency, and interactivity.

The study also broadly addresses the potential contribution of government websites to greater citizen participation by providing access to official information and

opportunity for interaction with governments through online communication. The study also reviews the exploratory question of about whether there has been significant growth in terms of government websites (in their attributes for greater transparency and interactivity) since they were first established.

1.4: Hypotheses

E-government has been proposed as a solution for increasing citizen communication with government agencies and better service delivery, which leads to citizen satisfaction with government (Chadwick and May 2003; Norris 2001; West 2004). As suggested by Tolbert and Mossberger (2006), the provision of information and delivery of services through e-government is significantly related to the opinion that government is effective at solving problems. Welch, Hinnant, and Moon (2005) suggested that e-government is likely to increase trust in government as a result of citizen access of information and uses of services offered online. The argument is that the use of government Web sites may lead to positive attitudes toward e-government, which in turn, may encourage improved trust or confidence in government.

The hypotheses tested in this study to examine the patterns of e-government development at two levels. At the first level, we test the differences between ministries grouped in functional categories, based on the assumption that differences in function types may be a possible underlying cause of differences in website content and functionalities. In the second test, we examine and compare scores between ministries at the four model Stages of e-government. The first test is based on the assumption that ministries' function types can influence website content and functionalitiesaq1. The

second test is based on the Layne and Lee model prediction that ministries are expected to have higher scores in the earlier Stages of e-government development than in the later stages. This is because of the expected tendency for e-government to evolve from information provision to progressively more complex services. Scores are, for these reasons, expected to decline through the successive Stages of e-government development.

This research model enabled us to compare functional group data scores (Hypothesis 1) and ministries' performance across the Stages (Hypothesis 2) to assess incremental progression predicted in the Layne and Lee model. The two hypotheses tested to answer the research questions in this study were:

Hypothesis 1: There will be differences in score counts between ministries across the Layne and Lee Stages of e-government development based on their functions and types of services.

Hypothesis 2: Based on the pattern predicted by the Layne and Lee Stages model, there are will be higher scores for earlier Stages of e-government than the scores for later stages.

To test these broad hypotheses, we test the prediction that higher Stages of e-government lead to more information and better delivery of services, and that this leads to greater citizen access to e-government. Government services, in other words, become more effective as e-government improves government processes, services, access to information. (Coursey and Norris, 2008)

In addressing these questions, a content analysis using content coding criteria developed by the CyPRG analyzes attributes of government websites. Coding items were selected to include content and functionalities that represent information, interactions, (and transactions) and horizontal and Vertical Integration.[5] In addition, an exploratory content analysis of government websites determines the current status of such websites. A model for e-government adoption, the Web Attribute Evaluation System (WAES), is used to compare the status of government websites between the years 2002 and 2007, to determine improvements and the current status of government websites. There is some empirical validation of the models' predictions of the steps to the Stages of e-government.

The variables for the study, selected through content analysis criteria applied by the CyPRG in worldwide studies of government websites (CyPRG, 2003), were re-developed to meet the purposes of this study. Hence, where CyPRG studies used openness, transparency and interactivity as variables, in this study, the measures were developed to represent the four Stages of e-government in the Layne and Lee model, the framework for this study. Studies have suggested that meeting citizen expectations for information provision, interaction with government officials, and access can contribute to such important outcomes as trust (Welch et. al., 2004). Some studies have therefore addressed questions such as citizen access, trust, and government website usability.

[5] Layne, K., and Lee, K. (2001), developing fully functional E-government: a four stage model. *Government Information Quarterly*, Vol. 18, pp. 122-136. Vertical Integration is the process enabling functional integration of different levels of a ministry's services, and horizontal integration is the integration of government services across ministries (pg XYZ)

Welch (et.al. 2004) found that citizens' experiences as well as satisfaction with e-government agency websites, and trust are interrelated.

1.5: Method

Using data from a content analysis conducted in 2009, this study examines the state of e-government implementation and its progress based on the Stages model evaluation of Kenya's governmental websites. The study compares website content and functional features between different ministries' websites, based on the types of functions they performed, using content analysis data scores. In addition, the study assesses information and services offered through websites established by government ministries overall.

Specifically, the study examines Stages data for website content representing Stages of e-government development. The features and functionalities represented information found on government websites (catalogue stage of e-government), transactions and interaction features allowing online transaction and communication between citizens and government officials (transactions stage), functionalities enabling citizens to access a ministry's services at different levels from a single convenient access point (Vertical Integration stage), and features that enabled a one-stop shop for accessing services and information across all government ministries (horizontal integration stage). The instrument used for data scores, the Website Attribute Evaluation System (WAES) was developed to measure website attributes, mainly, interactivity, transparency and

openness (La Porte, et. al, 1999).[6] It has been used to evaluate e-government development worldwide since 1997.

1.6: Significance of the Research

To date, no systematic study has been published that examines the adoption and status of government websites, e-government implementation strategies in African countries as a whole, or more specifically, in Kenya, the focus of this study. La Porte et al. (1999) studies the attributes of pubic agency websites in 192 countries and examined general factors affecting e-government adoption. An in-depth look at various dynamics affecting progress, as well as an examination of the factors affecting the realization of the positive impacts of e-government in a developing country, contributes to a better understanding of its direction. Few, if any, studies have been done about the experiences and progress in adopting e-government in Kenya. In particular, there is a lack of studies that specifically examine underlying factors affecting e-government in Kenya.

1.7: Justification for the Study

A study of government websites in a developing country contributes to the development of frameworks for the study of ICTs and their impact in countries where

[6] **The Cyberspace Policy Research Group** (CyPRG) has surveyed annually since 1997 all national level government web operations to assess 1) how widespread the Web has penetrated government organizations, and 2) how the Web technologies have been implemented in each organization and country. In particular, the research team has measured the degree of **openness** of each site, according to the Website Attribute Evaluation System (WAES). WAES provides measure of a variety of website attributes, principally, website **transparency**, and website **interactivity**, the two components of openness (Demchak, Friis & La Porte, 1999).

information infrastructure, the North-South digital divide, and underlying institutional factors prove challenging to the full realization of gains from e-government.

Few studies have examined developing countries' progress towards e-government, and the adoption of information and communication technologies. Raiti (2006) observed that information communication technologies for development (ICT) are a new field of study with few grand theories compared to other areas of social science. Raiti (2006) applied Habermas's theory of the public sphere to study mobile telephones in sub-Saharan Africa to demonstrate how ICT-for-development could expand upon the theoretical tradition within media studies.

There is a need for context specific research on e-government and its impact on the relationships between governments and citizens. The diffusion of the Internet has led to research using general surveys. Descriptive and explanatory studies of the transformative nature of e-government on government-citizen interactions are necessary.

The research contributes to an understanding of the implementation roadmap, which would benefit agency practitioners doing e-government projects. In addition, this study contributes to the examination of normative standards for evaluating the role of e-government for governments in developing countries. This supports the empirical assessment of the content of government websites and the information, communication and service delivery functions in developing countries.

1.8: Definition of Terms

E-Government: "the use of information and communication technologies to improve the efficiency, effectiveness, transparency and accountability of government" (WB[7]). *E-*

[7] World Bank…2005

Government refers to "the use technology to enhance access to and delivery of government services to benefit citizens, business partners and employees."

Government Openness: Openness is the extent to which an organization provides comprehensive information about its attributes and maintains timely communication with its various publics. Web Attribute Evaluation System (WAES) measures the elements of web attributes of transparency and interactivity to determine the degree of government openness (Demchak, et. al. 1999).

Interactivity: A measure of the level of convenience or degree of immediacy of feedback. Interactivity assesses the extent to which elements of transparency are "clickable" for a site visitor and its elements are ownership, reachability, organizational and operational information, and responses.

Transparency: This refers to the availability of information for navigating a large-scale social system. It constitutes a layman's map of the organization as depicted in the information on the site. Its elements include ownership, contact information, organizational or operational information, citizen consequences, and freshness (La Porte, 1999).

*E-services***:** the electronic delivery of government information programs, and services often (but not exclusively) over the Internet.

Stages Models - Stage models are predictable patterns which have been developed by scholars who study the phases of development of e-government. These scholars suggest that the growth of e-government takes place in stages and unfold as discrete time periods that result in discontinuity and can be used to benchmark e-government development towards joined-up government (Klievink, B. and Janssen, M. 2009).

Layne and Lee Stages Model - Layne and Lee's four-stage model (2001), used in this study, represents an evolutionary process of e-government development falling in four stages.

Catalogue Stage – This stage delivers some static or basic information through web sites.

Transactions Stage- This stage extends the capability of catalogue and enables citizens to do some simple online transactions such as filling government forms.

Vertical Integration Stage- This stage initiates the transformation of government services rather than automating its existing processes. It focuses on integrating government functions at different levels, such as those of local governments and state governments.

Horizontal Integration Stage- This stage focuses on integrating different functions from separate systems so as to provide users a unified and seamless service. (Layne, Lee 2001)

Chapter 2: Review of the Literature

This literature review summarizes the theoretical contexts, frameworks and proposed models for the evaluation and study of e-government. The review covers: (a) a concept explication of e-government; b) stage models for the study of e-government and the Stages or phases of e-government implementation; c) the attributes and characteristics of e-government services; d) studies of e-government; e) paradigmatic shifts associated with e-government adoption and implementation; f) e-government experiences of developing countries vis-à-vis those of developed countries; g) the Web Attributes Evaluation System (WAES).

The importance of communication to relationships between governments and citizens forms the basis of the argument that information and communication technologies present a significant opportunity for transformation and social change. E-Government is defined in the literature as the use of technology to re-engineer the citizen-government relationship and is a key driver for the modernization of government and the improvement in this relationship. Leith and Morison (2004) capture the centrality of communication by identifying key aspects of the government-citizen relationship. These include the nature and balance of dialogue and its terms; the origin and direction of communication flows; whether communication of information is a form of persuasion by rhetorical or other means; effects on the citizen; how ideas of consultation and dialogue presented within e-government models accord with the nature and role of discursive democracy and the extent to which the Habermasian concept of ideal speech is reproduced in the space created by e-government.

This discussion suggests a number of factors that make communication through e-government as the medium central to government-citizen relationship. These include the importance of dialogue enabled by portals that facilitate information flows. This is a major

transformation from traditional government communication. As Leith and Morison (2004) put it,

> "In its fullest form the e-government revolution would effect a transformation in government…"

Leith and Morison (2004), in suggesting that evaluation of websites is one of the best ways to analyze the citizen-government relationship, considered government websites as "the public faces of government that demonstrates their attitudes just as effectively as legislation (perhaps more so)."

Chadwick and May (2003) examined the shift towards e-government in the United States, Britain, and the European Union and presented three heuristic models of interaction between states and citizens that might underpin the practice of e-government. They identified the managerial, consultative, and participatory models of the relationship between government and citizens. They concluded that the democratic potential of the Internet has been marginalized as an executive-driven, managerial model of interaction that took precedence over consultative and participatory models. In tracing the core ideas and approaches associated with putting government online, the study observed that the way e-government will develop depends on understandings about the relationship between government and citizens. This relationship depends on the style of government and what shape the policy choices, managerial strategies and cultural responses will take. Advanced countries led the development of e-government and have largely shaped its evolution from establishing informational web presence to developing government-wide online information systems.

The three models of interaction between governments and citizens determine the emphasis on the desired outcomes, which range from participatory democracy (empowering citizens by providing access to information), managerial efficiency (improving service delivery and performance standards), or consultative (consulting with stakeholders and across government).

Although e-government is a recent development, taking shape only in the last decade, its adoption around the world has proliferated significantly rapidly. Research on e-government has also grown considerably. Some trends have emerged in the research on e-government (Heeks and Bailur, 2006; Reece, 2006; Calista and Melikisti, 2007). These include prescriptive studies taking a logical mapping approach to make sense of online content, its impact on society, and descriptive studies that examine the implementation of e-government into government practices and the possible outcomes (Reece, 2006).

Prescriptive studies attempted to assess the possible impact of the Internet without data and, for the most part, presented only a logical mapping between online characteristics and society. These prescriptive studies mainly offered a hyperbolic view of e-government suggesting that the impacts of the Internet were characterized by greater information flows and a capacity for its faster retrieval and use.

Descriptive studies have proceeded from the position that the Internet has a significant impact on government and politics. With the rate of adoption increasing in government practices, comprehensive studies have been done since the early 1990s to describe the depth and scale of e-government. Such studies, according to Reece (2006) have, in many cases, fallen short of offering an explanatory analysis, developing a theory,

identifying variables, or posing any hypotheses. Instead, these studies have mostly attempted to present comprehensive descriptions of e-government landscapes and the current practices of government agencies (La Porte et. al, 1999; Pina et. al., 2007). These efforts have included government reports assessing e-government systems and societal effects, industry studies on best practices, consulting groups reporting on e-government activities, and academic studies analyzing characteristics of national websites (West, 2000). Descriptive studies address questions on demand (what end-users want) and supply sides of e-government that should be studied as statistically relevant developments. Although descriptive studies do not explain or examine causal processes associated with e-government growth, they make important contributions to the research. These include insights into best practices and benchmarks for implementers of e-government, developing datasets for further research, classification schemes that further our understanding of the field, phases of web development, characteristics of the digital divide, and the development of methods such as web content analysis.

Research on e-government has begun to move in the direction of theory development through explanatory studies of how e-government functions and how variables are interacting (Chadwick and May, 2003; Kumar and Best, 2005). These studies also examine and attempt to explain the relationship between e-government phenomena and larger literatures in various fields (political science topics such as pluralism, public policy, political communication etc). Kumar and Best (2003) studied the correlation between the presence of Internet facilities in a village in India and the rate at which villagers obtained services. Wong and Welch investigated the relationship

between website openness and accountability in 14 countries on five continents. Carter and Belanger (2005) developed a model of factors that included the Technology Acceptance Model (TAM), the Diffusion of Innovations theory and web trust models to explain factors which predict citizens' intention to use e-government services. Reece (2006) acknowledges that theories of e-government have yet to emerge in spite of research efforts at explanatory or causal studies.

2.1: E-Government: A concept explication

Electronic government, defined as the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and agencies (Carter and Belanger, 2005), has been adopted by governments around the world as new technological developments and digitalization allow easier production, transmission and exchange of information. The World Bank defines e-government by listing its benefits as follows,

> the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government

management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.[8]

The adoption of e-government continues to be a dominant topic in studies focusing on developing countries. Perspectives drawn from these studies claim that e-government leads to citizen empowerment through improvement of government service delivery to citizens (Kumar and Best, 2006), plays a major role in the transformation of public sector operations (Welch et.al, 2004), enhances government accountability (La Porte, de Jong, 2000; Demchak, 2000; Demchak, Friis, and La Porte, 2000), and creates greater efficiency in service delivery, access of information for citizens (West, 2004; Pina et. al., 2007). In addition, they also make the claim that e-government can provide opportunities for cross collaboration and information resource sharing between governments, businesses, citizens and other stakeholders (Silcock, 2001).

It is widely held that ". . . the use of information and communication technologies to improve the efficiency, effectiveness, transparency and accountability of government" (WB)[9] is an essential innovation for the transformation of government services and the improvement of communication between a government and its various constituencies. Most studies associate "the use of electronic technology to enhance information access

[8] The World Bank, What is Governance?, http://www1.worldbank.org/mena/governance

[9] World Bank…2005

and delivery of government services to citizens, business partners and employees" (Silcock, 2001) with social change. The introduction of such capabilities e-services (delivery of government information electronically), e-management (improving management through electronic communication within and outside government), e-democracy (enhancing citizen participation in democratic activities through online communication), and e-commerce (online transaction for the delivery of services) can transform the relationship between government and citizens Cook's (2000).

Scholars do not fully agree on the nature, extent and significance of changes brought about by e-government. Some studies argue that e-government reproduces the same patterns of communication associated with conventional practices in traditional bureaucratic systems (Information Society Commission, 2003). Others have argued that electronic communication opens up more channels of communication and gives citizens greater access to government officials than was possible with communication under traditional bureaucratic systems (Coursey and Norris, 2007).

The assumptions and claims about the contribution of electronic government to restructuring service delivery by public agencies at different levels are varied across studies. Some scholars assume that the technologies will lead to change, while others suggest that the use of technology is socially constructed and would mostly be shaped by the ways each government adapts its processes to new ICTs. Heeks and Bailur (2007) presented a framework for understanding perspectives and impacts associated with IT introduction and its underlying issues to aid the understanding of changes in public agencies. Their framework included perspectives on technological impacts and causes of

those impacts. Technological determinists have associated the introduction of ICTs with positive impacts while social determinists suggested that human choices within social structures determine the impacts of the introduction of ICTs. They concluded that positive and negative impacts can accompany the introduction of ICTs into the public sector and this could affect users in a number of ways. On the other hand, they associated the causes of those impacts with human agency shaped by social contexts.

2.2: Theoretical Perspectives on e-Government

The study of advanced information and communication technologies forms part of the discourse on communication for development in developing countries. A number of development theories have been used in studies of the use of mass communication to improve the conditions of these developing countries. Among these are modernization, world systems, dependency, and globalization. These are the theoretical frameworks that have been used to interpret development efforts in the developing countries. These theoretical perspectives allow us to study and clarify concepts, in economic and social perspectives, as well as to situate social policy recommendations in context (Reyes, 2001). There are convergences in the perspectives these theories provide for the systematic study of social change in developing countries. For example, the theory of globalization coincides with some elements of the theory of modernization in that both theories state that the direction developing countries ought to take should follow the model of advanced western nations' development.

Based on these schools of thought, the main patterns of communication and the tools to achieve development originated in those more developed nations (Smith and

White, 1992). However, while the modernization perspective follows a more normative position, suggesting the use of mass communication for the transfer of modernizing values to developing countries, the globalization approach takes the positive perspectives that emphasize cultural and economic factors as the main determinants which affect the social and political conditions of nations. This perspective suggests that the systems of values between the dominant and the developing nations determine economic and social differences. For the globalization position, the current world conditions can only change with the diffusion and transference of values through communication systems that are increasingly impacting all nations. The globalization and world-systems theories take a global perspective as the unit of analysis, rather than focusing strictly on the nation-state as is the case in the modernization and dependency schools. The world-systems theory identifies societies and economies structurally in terms of their relative position in the world economic power structure. Globalization bases its theoretical foundations on the structural and functionalist point of view. The globalization perspective envisages the gradual changes in societies as current innovations, particularly in the areas of communication and the economic sphere.

The globalization and world-systems theories, and to some extent the dependency approach, take into account the impact of recent economic changes in world structure and relations occurring in the last two decades. Such changes include the use of modern technology in information, computers, and in communication systems. The main feature in the last two decades is the Internet system which allows the achievement of more rapid and expansive communication. The Internet is increasingly creating conditions to

transform not only the structure of the world system but also the way development communication is understood and applied for socio-economic change in developing countries.

The theoretical framework for this study of the impact of the Internet as an information and communication tool for social change in developing countries is influenced by the modernization and technological determinism perspectives. Mass communication approaches to the study of the role of the media in developing countries applied the modernization paradigm, commonly referred to as the dominant paradigm, which gained prominence in the 1950s (Roman 2005). Proponents of modernization theory hypothesized a direct relationship between mass communication and the process of changing traditional societies to modern ones. The dissemination of developmental information, mostly following the model in western industrial countries, was expected to have the effect of transforming traditional societies into modern ones. Schech (2002) argued that the promises of new technologies for developing countries, formulated within the broader discourse of modernization and development, is premised on the assumption that a deficiency in knowledge is responsible for underdevelopment. Information and communication technologies are seen, through this perspective, as a means for the diffusion of knowledge and information required for development. This view is, in many ways, similar to the view of the radio as a conduit for the diffusion of western knowledge to the rest of the world which characterized early modernization thinking. According to Schech (2002), ICTs are comparable to the radio in their respective periods and they demonstrate a continuity of modernization thinking; however, ICTs represent a shift from

centralized state-led development to a decentralized vision of development that empowers citizens for greater participation in government. Pioneering studies such as Lerner's (1958) suggested that exposure to national and international media eased the transition for Middle Eastern populations from traditional to modern societies. Studies by Schramm (1964) saw the media as a way of expanding the horizons of traditional societies while Pye (1970) saw a role for communications in the political development of new countries.

While modernization theory has been discredited in recent times, the idea of communication for development has remained a crucial model for studying developing countries. Roman (2005) suggested that the study of communication phenomena is relevant for developing countries where social change and modernization (driven by dissemination of information) are expected to take place. Studies of the impact of the Internet, therefore, are, partly, based on the underlying discourse of communication for development. The argument of these discussions is that modernization remains a dominant underlying approach to the framing of the role of ICTs in development. Modernization theory perceived development as spreading from the west to the rest of the world aided by modern communication technologies. In this view of ICTs for development, ICTs are considered vital to the production and transfer of knowledge for development by governments to communities in developing countries.

The technological determinist view is a technology-led theory of social change: technology is seen as causal factor for change. According to technological determinists, communications technologies or the media (or more broadly, technology in general) are

major causes of change in society, and technology is seen as an important factor underlying the pattern of social organization (Heeks and Bailur, 2007).

Technological determinists interpret technology in general and communications technologies, in particular, as the basis of changes in society. New technologies, according to this view, transform society at every level, including at institutional levels, social levels and individual levels. Technological determinism focuses on cause and effect relationships, and this focus makes it an explanatory and predictive theory. Studies of communication technologies commonly take deterministic perspectives (Fairchild and Quansah, 2007). Theorists have argued that changes brought about by communication technologies, such as electronic government, have an important impact. They regard such changes as capable of transforming society and its institutions (Heeks and Bailur, 2007).

Many studies of mass communication in Africa have paid attention to the development and social change role of communication media. The ICT-for-development discourse has encouraged many developing countries' governments to formulate and implement ICT-centered plans, beginning with e-government, as part of their development strategies. The assumption (based on the modernization and the technological determinist discourses) that technological advancement will result in social change is common in research on communication for social change in developing countries (Howcroft, 1999). Howard (2007) referred to this as the "leapfrog" hypothesis which is the opportunity for developing countries to harness ICTs for development.

By enabling governments to provide greater information access and effective services delivery for citizens, ICTs create competitive economic environments, and

enhance the quality and levels of services in a country (Meso et. al, 2004). More importantly, e-government is expected to enhance the awareness and knowledge of the country's citizens, resulting in higher participation in governance. The concept of governance has a direct relationship to national development because it deals with the way a country manages its resources for development (Howard, 2007). The level of development of communication in a country can significantly impact change, as studies in developing countries have found (Schech, 2002; Meso et. al, 2006; Basu, 2004), good governance and socio-economic performance have a direct relationship with access to information.

2.3: Models and Stages of e-Government

The Stages model-based approach to the study of e-government studies is commonly used for evaluating e-government development in countries. It involves the assessment of the various Stages of growth of government websites. It assumes that as government websites grow from one stage to another they improve capacity to deliver more services to citizens. Versions of the stage models vary in terms of the number of stages, with some suggesting four, five or even more Stages that broadly include the information, interaction, transaction, and transformation Stages (Coursey and Norris, 2008). The models give some insights into Stages of growth of e-government. These Stages of growth of e-government can be analyzed from different theoretical perspectives that might offer insights on changes associated with e-government.

Coursey and Norris (2008) present a summary description of the models of web Stages approach to the evaluation of e-government. According to their study, e-

government evolves in several distinct Stages that reflect changes in its development and can be used to measure progress. These Stages distinguish where different government and specific agencies are on the road to transformation (Jae Moon 2002; the UK National Audit Office, 2002); the UN/ASPA, 2002; Santos and Heeks 2003; Layne and Lee 2001; and West, 2004).

The Stages of e-government include but are not limited to: (1) the billboard (information) stage; (2) the partial service delivery (interaction) stage; (3) the portal stage (transaction) with fully executable and integrated service delivery; (4) the seamless (transformation) stage with full integration of e-services across administrative boundaries; and (5) the interactive (e-governance) democracy stage.

As described by Coursey and Norris (2008), Stage 1 is the most basic form of e-government and simply disseminates information, by posting information on Websites. Stage 2 is a two-way communication wherein the government incorporates e-mail systems as well as information and data-transfer technologies. In Stage 3, government provides online services and financial transactions by gradually phasing out direct services by public officials. In Stage 4, the government attempts to integrate various government services vertically and horizontally. Stage 5 involves the promotion of Web-based political participation in which government websites include e-governance tools such as e-democracy.

In all, the models predict that e-government will move beyond information provision and interactivity to become fully transactional. They also predict that e-government will fundamentally transform the relationship between governments and

citizens. The models become normative when describing fully developed e-government, and assert what e-government *should* become. The models implicitly presume that fully transactional systems are better and that more citizen interaction equals improved service (Coursey and Norris, 2008).

These models are partly predictive, partly descriptive, and partly causal normative (Reece, 2006; Coursey and Norris, 2008). They predict that governments will move stepwise toward the adoption of more sophisticated e-government services, from information, transactions, integration, and then ultimately to transformation (Coursey and Norris, 2008).

2.4: E-Government Studies

Since the introduction of e-government, researchers and scholars have discussed its possible impact on the transformation of the functioning of government and the impact on the relationship between citizens and governments (e.g. Reece, 2006; Heeks and Bailur, 2007; Siau and Long, 2005; Basu, 2004; West, 2004). In recent years, researchers have increasingly focused their attention on the attributes of government websites and features that support claims about their effect on government-citizen relationship.

Some scholars argue that government websites offer access to information about government agencies that citizens did not previously have. This makes government more transparent (Short, 2007). Others suggest that because of their interactive features, government websites offer citizens the opportunities to engage in dialogue with government officials, thus improving public officials' accountability and increasing trust

between government and citizens (Welch et.al., 2004; Carter and Belanger, 2004; Pina et. al., 2007; West, 2004; Chadwick and May, 2003).

According to these views, e-government eliminates barriers between governments and citizens that otherwise impede government-citizens relations. Skeptics argue that e-government reproduces the same bureaucratic structures from traditional forms of government (Welch and Wong 2004). It is further argued that e-government often only exacerbates the existing nature and attributes of public bureaucracies. E-government accountability, they argued, is more related to bureaucratic styles than to technology per se. The central question is, according to this argument, whether e-government leads to a more transparent, interactive, open and, accountable government.

The CyPRG, the source of data for this study, has since 1996 studied the diffusion and use of the World Wide Web by governments worldwide, particularly in terms of organizational openness and internal effectiveness. The CyPRG website provides information and research resources such as the detailed explanation of the Website Attribute Evaluation System (WAES) developed in 1997, web content coding, updates on new and existing national websites, and sample interview guidelines.[10] From 1997 to 2000, the CyPRG, with funding from the US National Science Foundation, collected data on organizational transparency, openness, and effectiveness in 192 governments across the globe.

[10] See: http://www.cyprg.arizona.edu/index.html

2.5: Advantages and Benefits of e-Government

Scholars have suggested advantages that can be associated with the establishment of electronic government such as facilitating general compliance, citizen access, participation, and service integration, among others (Zhiyuan, 2002). According to some recent studies, interactive government websites encourage greater citizen participation in decision-making (Carter and Belanger, 2005), increase citizen satisfaction and trust in government and increase levels of accountability by government agencies (Wong and Welch, 2004). Government websites can also foster cross-agency collaboration. Zhiyuan (2002) outlined a number of e-government collaboration models that include "government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G) and government-to-employee (G2E) . . . interaction models. Other studies conclude that citizens become more engaged in decision-making by governments, gain access to more information about the performance of their governments and develop stronger relationships to and greater trust of, governments (Basu, 2004).

2.6: e-Government in developing countries

A central argument in this study is that the impact of e-government on government-citizen interactions is influenced by a combination of factors, and that the attributes of government websites essential to their usability, their impact on services and information delivery, and their contribution to the transformation of government-citizen relations. It is therefore necessary to examine these web attributes as a means of confirming claims and predictions about social change. Further, this study argues that while the necessary conditions for the effective implementation and utilization of

electronic government are not available in developing countries, the status of government websites, as developed so far, have not been subjected to direct and critical empirical observation in spite of the rapid proliferation of the Internet as a medium of communication.

As earlier stated, the adoption of e-government is widespread as are speculations about the nature, significance and impact of its use. Trends in its application suggest its uses vary from one government to the next and success is dependent upon factors beyond technological innovation. The differences arise from a number of factors such as a country's amount of communication infrastructure, a government's commitment to developing e-government, and the degree of citizen access to information technology services. For these reasons, it remains unclear how the establishment of government websites is going to change relationships between governments and citizens, or change service delivery and transformation of government especially in resource challenged developing countries where access issues are critical.

The expected impact of e-government in increasing access to information and encouraging greater citizen participation will have significant implications for poor countries where underdeveloped institutions have meant poor access to information and ineffective delivery of services (Meso et. al., 2004; Basu, 2004; Kumar and Best, 2006; Putnam, 1995). As Howard (2007) concluded, ICTs would enable developing countries to make the hitherto elusive socio-economic progress, allowing democratic policy-making and communication infrastructure to help a country to leap forward.

Research on e-government impact in less developed countries is still scarce compared to that on developed countries. Much discussion in academic literature about the impact of electronic government (e-government) in transforming relations between government and citizens, businesses, and other arms of government, draws on experiences from the study of developed western countries (Dada, 2006).

Although e-government technologies have the potential to improve the lives of people living in developing countries, so far developed countries such as the U.S., Canada, the UK, and Australia remain the leaders and are reaping the benefits of e-government implementation (Chen, et.al, 2006). The gap between developed and developing countries in ICT infrastructures, practices, and usage remains wide. Among other challenges, developing countries lack capital to build up national information infrastructure on which e-government is based. They also lack the knowledge and skills to develop suitable and effective strategies for establishing and promoting e-government.

Opinions vary with respect to the outcomes that can be expected from e-government in developing countries. Some experts believe that e-government is going to revolutionize public sectors and political processes worldwide and, in particular, give developing countries a chance to "leapfrog" their way towards good governance (Hammond, 2001; Howard, 2007; Mowlana, 2001)

However, the changes predicted to occur owing to the adoption of e-government are, for developing countries, unsubstantiated and there is a need for much more empirical work. While studies suggest that the transparency and interactivity of government websites encourages openness and leads to better service delivery and

greater citizen participation in government (Welch et. al., 2004; Carter and Belanger, 2005; Meso et. al., 2006; Choudrie and Gheorghita, 2005; OECD, 2005), these claims have yet to be examined in developing countries.

In particular, it is necessary to examine the suggestion that government websites provide citizens with the opportunity to interact with their governments to access services and information in ways that have not been possible under traditional forms of government-citizen communication.

Developing countries are challenged by factors such as the digital divide between those with Internet access and those without access. This renders e-government inaccessible to many citizens and therefore not as effective in transforming citizen interactions and relationships (Howard, 2007). Norris's (2000) study of the digital divide showed how citizens' lack of access to the Internet decreased the significance of e-government in transforming the relationship between government and citizens. Other studies have shown that, since the introduction of e-government, websites established by governments have remained at the information bill-board stage and have not contributed to greater access to information nor to better communication between governments and citizens. A key argument in these discussions is that changes in the relationship between government and citizens, which are supported by web-based communications, require dynamic improvements to the features of government websites.

Chen et al., (2006) identified a number of distinct factors that represent the difference between developed and developing countries in terms of Internet development and, implicitly, the readiness for e-government. Developed countries have more advanced

economies and are more stable socially, politically, and culturally than their less developed counterparts. Developed countries are more technologically advanced than less developed countries and have better trained and qualified technologically trained workers. The attainment of education, skills and financial resources needed to support IT departments which would implement e-government, remain a challenge for less developed countries.

Comparisons of the size and capabilities of infrastructures reveal considerable differences between developed and developing countries. Developed countries have the infrastructure levels and capabilities to make Internet and telephone access available to almost all of their residents, some with populations over 300 million. The insufficient infrastructure of developing countries, because of economic conditions and governmental regulations of telecommunications industries hinder the progress of e-government in these countries.

Developing countries lack the financial resources, government stability and structural capacity to develop a sizable infrastructure. This results in low access to Internet and telephone services. One third of the world's population has never made a phone call, and 63 countries have less than 1% access to the Internet (ICeGD, 2002). In developed countries, most citizens have access to the Internet, and the rate of computer literacy surpasses that of developing countries.

While government officials should understand and value e-government, this is not the case in developing countries. The level of resources they are willing to allocate is dependent on their understanding of technology and the benefits that will ensue. In

developed countries, most government officials use the Internet or computers on a daily basis. Therefore, government officials in developed countries are familiar with technology and realize how efficient it is. This increases their dedication to allocating additional resources for further implementation. In developing countries, IT is a vague concept, and government officials are somewhat unwilling to allocate already scarce resources toward something they are not familiar with.

2.7: e-Government and Paradigm Shifts

The advent of the Internet and digital connectivity as well as the explosion and growth of e-commerce and e-business models in the private sector, have encouraged the public sector to rethink hierarchical and bureaucratic organizational models. This has meant reorganizing methods of delivering public services through innovation (using new communication technologies). Governments worldwide are faced with the challenge of transformation and the need to modernize administrative practices and management systems (Tapscott, 1996).

Governments around the world have begun to recognize the potential opportunities offered by ICTs and e-business models to meet citizens' demands, to offer better services to citizens and to increase efficiency by streamlining internal processes. Tapscott and Caston (1993) have argued that ICTs have led to a paradigm shift by introducing the age of network intelligence and by, reinventing businesses, governments and individuals. This paradigm shift has had significant impacts on the way the public sector functions. The traditional bureaucratic paradigm, characterized by internal productive efficiency, functional rationality, departmentalization, hierarchical control,

and rule-based management (Kaufman, 1977), is being replaced by competitive, knowledge-based economy requirements. These include flexibility, network organization, vertical and horizontal integration, innovative entrepreneurship, organizational learning, quicker services delivery, and a customer-driven strategy. This new paradigms shift toward an emphasis on coordinated network building, external collaboration, and customer services (Ho, 2002).

The development and implementation of e-government brings about impacts and changes to the structure and functioning of public administration (Snellen, 2000). In a traditional bureaucratic model, information flows only vertically, and rarely between departments. With e-government, new technology links with traditional systems internally and, then links government information infrastructures externally through digitalization (Tapscott, 1995). E-Government breaks down agency and jurisdictional barriers to allow more integrated government-wide services across all levels of government. Traditional government environment used to make it more difficult to access government information, with no access available for people in remote locations. E-Government offers a potential to increase access to information and services, and makes it easier for citizens to participate in and contribute to governmental processes.

Assumptions and predictions about the contribution of electronic government to the restructuring of service delivery by public agencies are challenged by inconsistent levels of public organizations' commitment and capacity to apply information technologies to transform government. On the other hand, the expectation that users of government services will adapt to information technologies (innovations promising more

efficient delivery of services and interactions with government agencies has yet to be systematically investigated, especially in developing countries.

The challenges to studying electronic government in developing countries, for example, range from digital inequalities, the lack of basic infrastructure, the lack of access to information technologies, poor distribution, and the slow growth in public and commercial exploitation of ICTs. Another major challenge to studying e-government in developing countries is the fact that ICTs are yet to be productively implemented and exploited in developing countries. Developing nations have a slow adoption rate for new technologies and citizens take a long time to embrace the benefits of these technologies because of scarce resources and competing economic priorities. Socio-economic factors have a major influence on the implementation of e-government.

Empirical studies might easily be undertaken in developed countries with foci on a broad range of factors such as audience (user) variables, information dissemination and liberalization and institutional change as a result of electronic government. These variables have not been adequately observed in developing countries and this limits empirical studies of the Internet, information technology use, and e-government in developing countries. This raises the important question about the generalizability of findings of studies of information technology in developed countries. How, for instance, can we study user perceptions about the benefits of the Internet in a country where the cost of accessing the Internet is prohibitive?

In recent years, a number of researchers have evaluated the status of e-government implementation, the potential for citizen empowerment through online access

to government information and services, and the general improvement of government performance using ICTs (Schech, 2002; Howard, 2007, Meso et. al., 2006). However, most empirical studies have concentrated on western countries (La Porte. 2002)), and a few studies have focused on Asian countries (Holliday, 2002).

Clearly different social, cultural, political and economic conditions affect the adoption and implementation of e-government programs in different countries. Studies of the experience of African countries in the adoption and implementation of e-government have focused mostly on the diffusion of the ICT's, the implications of the North-South digital divide, the socio-economic conditions that affect ICT's development in Africa and the technological infrastructure challenges these countries face. The actual experiences in the implementation and use of e-government for improving citizen participation in government have not been adequately studied in developing countries.

African countries are at an early stage in the implementation of e-government (Salter, 2003) and are still far behind in adopting e-government development. Kenya, like other African countries, has created government ministry websites. The creation of government websites is generally seen as a first step towards implementing full e-government strategies (Layne and Lee, 2001; Netchaeva, 2002; Silcock, 2001). To date, no systematic study has been done to examine the adoption and status of e-government, government websites, or implementation strategies in Africa as a whole, or specifically in Kenya, the focus of this study. Some studies have described the implementation of e-government around the world (La Porte et. al., 1999) without taking an in-depth look at the experiences and the dynamics affecting progress in the adoption of e-government.

Nor have any studies examined the factors that affect the realization of the positive impacts of e-government. No studies about the experiences or progress of adopting e-government in Kenya have been done.

2.8: The Internet in Kenya

Before the introduction of government websites in Kenya, there was virtually no coherent access to government information for the majority of citizens. Citizens relied on intermittent pronouncements by key public officials, direct individual contacts with government officers in their offices, broadcasts of news on national radio and television channels, and, for those who could afford it, opportunity to purchase official documents published by the *Government Printer*, the official publisher of government documents.

The introduction of government websites and access to the Internet, however limited, is for these reasons a major milestone in the flow of information and the development of government-citizen interaction. It is thus reasonable to speculate that the implementation of e-government has the potential to have far reaching impacts on society.

The full exploitation of Internet capability and of e-government depends on a number of factors. Among these are the development of the Internet infrastructure, the improvement of human resource capacity and the reservoir of knowledge and skills needed to deploy the potentiality of information and communication technologies for social change.

The Internet was introduced to Kenya in early 1990s. As with many other African states, Internet development in Kenya was primarily led by people with international

exposure and contact. Examples include Kenyans returning from overseas studies, western expatriates, inter-governmental organizations and NGO employees.

As in advanced western countries, initial access to the Internet was primarily sought for e-mail communication. By the end of 1995 there was a reported 100 Internet users in the Nairobi area, and by the end of 1996 this number had grown to about 3,000. Recent estimates of Internet users in Kenya stand at 3,359,600 as of June 2009, representing 8.6% of the population. This represents an increase of nearly 8% compared to the numbers for the previous report years (200,000 or 0.7% for the year 2000, and 3 million or 7.9% of the population for 2008).[11] Serious users maintain accounts with multiple Internet service providers (ISPs). At the same time, many accounts support multiple users. These two factors undermine more accurate estimates.

When the first commercial Internet services were offered in Nairobi, they were met with mostly negative reactions by those unfamiliar with the Internet. At the time, in 1995, international Internet media reportage focused on stories about websites containing culturally unacceptable information such as pornography, dangerous chat-rooms, and radical and sometimes illegal political movements from all over the world. This drew the concern of Kenyan policy makers who, like their western counterparts, were understandably concerned about these negative uses as well as the potential for criminal applications of the Internet. To counter this perception, Internet access was made available to journalists for educational purposes. This approach seemed to have

[11] International Telecommunications Union (ITU), World Telecommunication/ICT Indicators Database 2010 (14th Edition)

succeeded in bringing attention to and publicizing the many positive aspects of the Internet.

At the initial stages, the most common primary use of the Internet in Kenya was for international e-mail communication. However, most commercial firms that have Internet access have used it not only for cutting overhead costs by substituting Internet for long-distance phone and fax communication, but also for other applications, which has increased these businesses' efficiency.[12]

2.9: e-Government in Kenya

As acknowledged in government policy documents, mainly the cabinet paper on e-Government approved in 2004,[13] e-government is considered a key plank in the transformation of the delivery of services and in the restructuring of government. According to this policy statement the government laid out long term plans for establishing e-government and pursuing the objective of better delivering services and restructuring its operations. These plans include the establishment of infrastructure, developing the human resources capacity, and restructuring government's operational processes.

The introduction of the e-Government initiative in Kenya can be traced to the establishment of an inter-ministerial committee on electronic service delivery in June 2003, followed by Cabinet approval in 2004. The e-government strategy, approved in

[12] CIDCM Telematics for Development Working Paper Series Aug. 1998 - Research funded by the Leland Initiative to provide some twenty African countries with full Internet connectivity in order to stimulate development. (http://www.info.usaid.gov/regions/afr/leland/project.htm, 12.15 PM, Jan 28, 1998)."

[13] Cabinet Office, Office of the President, (2004) E-Government Strategy: The Strategic Framework, Administrative Structure, Training Requirements and Standardization Framework.

January and published in March 2004, was described as another framework for delivering "a better life through services in a better, convenient, and cost effective way. The e-government strategy is thus linked to the mandate and pledge made by the government to change the lives and livelihoods of citizens for the better. Potential benefits expected include services enabling citizens and business to file tax returns and make tax claims online, download passport forms online, and for government to undertake police operations online.

The following is a brief overview of the development of e-government in the context of in Kenya as an example of a developing country. It includes the framework for e-government as explained in the Kenya strategy document, the milestones so far attained and the challenges that remain unresolved.

The overall goal of e-government, as stated in the policy document (Government of Kenya, 2004) is to make the government more results oriented, more efficient, and more citizen-centered. According to the Kenyan plan, e-government should enable citizens to access government services and information as efficiently and as effectively as possible through the use of the Internet and other channels of communication. The objectives set out in the e-government strategy documents included the improvement of collaboration between government agencies to enhance efficiency of resource utilization; the improvement of Kenya's competitiveness through timely provision of information and delivery of government services; the reduction of transaction costs for the government, citizens, and the private sector through the electronic provision of products

and services; and the creation of a forum for citizens' participation in government activities.

The e-government strategy for Kenya also outlined activities and critical processes for the modernization of government. These measures are meant to encourage the enhancement of transparency, accountability, and good governance. The strategy recognized the need for training all government staff for the effective and efficient realization of e-government objectives. Due to this re-training of staff e-government induced a paradigm shift in government operations and delivery of services.

E-government is seen as one of the highest priority core poverty reduction programs that will contribute significantly to the achievement of sustained economic growth and poverty reduction, and lead to the attainment of the Millennium Development Goals (MDGs)[14] in Kenya. The basis of this vision was the belief that e-government would facilitate better and more efficient delivery of information and services to citizens, promote productivity among public servants, encourage participation of citizens in government, and empower all Kenyans. For the government to serve the people better and to meet its development objectives through e-government, considerable investments in institutional capacity building would be needed. In addition, the government would need to commit to human resource development and the development of information and communication technology (ICT) infrastructure. Appropriate policy and regulatory reforms are also required to ensure equitable, reliable, and affordable access to government services and information.

[14] UN Millennium Development Goals (MDGs) are goals set by the United Nations as a benchmark to be attained by member nations by the year 2025

The government has created an institutional structure for coordinating and overseeing the implementation of e-government. The implementation structure included the Cabinet Committee on ICT (with oversight responsibility for the implementation of e-government strategy, and the permanent secretaries' (PSs) ICT Committee (to coordinate the implementation of e-government and ensure all goals are reached). In addition, e-government committees established in ministries were given the responsibility to review ICT projects in the ministries, undertake audits of IT capacity, establish support to the ministries' policy mandate, identify both technical and institutional gaps and inadequacies, and make appropriate recommendations. A directorate of e-government was constituted to coordinate and prepare the government as a whole, including planning the implementation, monitoring, and evaluation of the process.

Since its launch in 2004, the e-government project has achieved a number of milestones. These include the training and planning workshops for all implementation officials at which e-government implementation has been discussed. An inventory of ICT capacity and assets within Government has been taken as a baseline statement of capacities and capabilities. Infrastructure development is an on-going project for most government buildings (to provide connectivity between and within government offices), and an internal communication system has been established (including e-mail addresses for all public officials). In addition, training programs were developed and ministries are required to train staff for work in an e-government environment. Policy support instructions such as security guidelines for the use of ICTs in government offices were

developed to ensure that ICT equipment and services procured and used in government meet stipulated security standards.

Kenya's e-government implementation framework has adopted the OECD guiding principles which include leadership and commitment, integration, inter-agency collaboration, financing, access, choice, citizen engagement, privacy, accountability, and monitoring and evaluation as the beacons for evaluating the success of national e-government effort.

Among factors considered critical to e-government implementation in Kenya are leadership, financial support, public-private sector partnerships, international collaboration, a strong regulatory framework, human resource capacity development, management, process re-engineering and legislation (Etta and Elder, eds., 2005; OECD Policy Brief, 2003).

Major challenges still remain for the implementation of the e-government strategy in Kenya. ICT human resources are limited in government, and institutional infrastructure to facilitate a faster implementation of the e-government strategy has remained limited. The directorate of e-government acknowledged that ICT systems which have been installed so far remain disjointed and fragmented and the ICT solutions are generally under-utilized, contributing to duplication and waste. The lack of ICT standards hinders widespread growth and utilization of applications. In practical terms, the government recognizes that a number of technical, operational, and regulatory prerequisites must be instituted before e-government can impact the efficiency and effectiveness of service delivery to citizens, poverty reduction, and economic growth.

Among other challenges, the government recognized the need to develop a plan to refocus the implementation of the e-government strategy. The plan proposes measures for putting in place viable public-private partnerships for the purpose of achieving the objectives of the e-government strategy, for enhancing partnerships, mobilizing resources, and for speeding up activities for rapid results.

The major points of focus in the medium term are the automation of back-office systems, the acceleration of connectivity, and the integration of systems and records, and the development of capacity within government. These medium term goals are expected to translate into better communication and information sharing within the government. The main tasks to be accomplished within the medium term period are prioritized to include staff training, e-mail communication, integrated service delivery systems, implementation of countrywide public information infrastructure, digitization of government information and records, and operationalization of electronic databases and data sharing within the government.[15]

The medium focus of the e-government strategy was to spread and deepen the efficiency and effectiveness of service delivery to citizens and to the business community. The government tried to provide citizens with government publications, such as the *Kenya Gazette*,[16] laws and regulations, immigration forms, passport application forms, among others, through websites. Other initiatives identified in the e-strategy policy include a government-citizen communication system to enhance participatory

[15] Cabinet Office, Office of the President, (2004) E-Government Strategy: The Strategic Framework, Administrative Structure, Training Requirements and Standardization Framework.
[16] Kenya Gazzette, Official government publication which publishes such information as statutory and legal notices, executive orders etc.

dialogue, electronic services, electronic payment systems and better communication between citizens and state officials.

The Kenya government views e-government as an important part of its efforts to modernize services and access to information. This is because e-government provides a common framework, goal and direction for the transformation of public sectors. It aims at making governments more results oriented, efficient, and citizen centered. But the Kenyan experience shows that a number of key technical, operational, and regulatory prerequisites need to be met before e-government can have an impact on the efficiency and effectiveness of service delivery to citizens, poverty reduction, and economic growth.

Chapter 3: Method

3.1: Introduction

This chapter of the dissertation is dedicated to discussing the method used to generate the content analysis data, which will form the basis of my analysis of e-government Stages of growth in developing countries. More specifically, the chapter will outline the content analysis coding scheme, the Stages of e-government as a study framework, the population of the study (the 46 ministries of Kenya's central government), and the analytical approach. The chapter also explains the methodological reasons for content analysis as the foundation of the study, as well as the limitations of studying content as a means of examining e-government development.

The data analysis and results of the study presented in this chapter are organized in the following sections: 1) research statement, data collection and the content coding scheme, 2) the study site including the government ministries are their websites' key attributes, 3) the Web Attribute Evaluation System, 4) the Stages model of e-government instruments, 5), the findings: information, communication and interaction, and 6) a discussion of the research questions and analysis

The first section presents a description of data collection procedures for the content analysis and a summary discussion of the characteristics of the websites. This is followed by a description of the instrument, the WAES, used for the evaluation of Kenyan governmental websites and a discussion of the Stages model of e-government applied in this study. The next section describes Kenya's e-government based on the content analysis data. A summary of the findings on the attributes of the websites'

information content, communication and interaction features (derived from the content analysis) follows. The chapter concludes with a discussion of the hypotheses related to the research questions and an analysis of the results.

This study describes the implementation and development of electronic government (e-government) in a developing country using the Stages model as a framework. The method for the study is a content analysis of government websites using the Web Attribute Evaluation System (WAES). The study's design included prospective and descriptive analysis. The "sites" for the study were all of the websites of the Government of Kenya ministries (excluding subordinate agencies and departments). Kenya has a centralized government structure and ministries are the principal agencies coordinating services. The government serves a national population of nearly 40 million spread across all parts of Kenya. Kenyan ministries implement policy and coordinate services delivery and are therefore central to the communication and service delivery functions of all parts of government. Departments and regional extensions of ministries' functions are controlled by the central authority. Provision of information is a key part of the delivery of services. Online communication is a major step in improving information delivery and government-citizen communication.

3.2: Research Questions and Hypotheses

Research questions were developed to determine the presence of information, communication and interactive content which are indicators of transparency and accessibility (interactivity). Based on the presence of these attributes of ministries' websites, the Stages of e-government at the time of the study are described. In broad

terms, the research questions addressed the attributes and content quality of ministries' websites as indicators of the delivery of information and services to citizens. The underlying hypothesis was that higher Stages of e-government development indicate greater accountability and greater information access for citizens. The content analysis for this study was used to test the following research questions and test the related hypotheses that follow.

> *RQ 1:* Using the Layne and Lee Stages model as a framework, are some types of ministries advancing faster than others through the Stages of e-government development based on their types of functions and services

This research question provides a benchmark of information available on the websites. This information helps identify how useful the websites are for various publics (citizens, business organizations, and other categories that may need government services. The research question also helps to identify the content focus of the websites (focus on policies, guidelines, legal requirements, rules and regulations, news announcements, where to get help, upcoming events and developments). This hypothesis aims examines the information services of a ministry from the perspective of its functions.

RQ 2: Do Kenya government ministries' websites develop according to the sequence predicted by the Layne and Lee Stages model for e-government development?

This research question provides a basis for demonstrating the predictions of the Layne and Lee model of e-government growth through a comparison of scores of each ministry across the four Stages of development.

3.3: Hypotheses

Given the increasing studies of the impacts of e-government, its widespread adoption, and the predicted transformations for citizen-government communication, it is expected that government ministries' websites, once established, tend to produce improved accessibility of government for citizens, improve information availability and make services more efficient (Chen, 1995). Hence, hypothesis 1 is stated as:

Hypothesis 1: There will be differences in score counts between ministries across the Layne and Lee Stages of e-government development based on their functions and types of services.

As suggested by Coursey and Norris (2008), we assumed that ministries' functions influence the type of information, communication, and online transactional services they provide on their websites. We used this assumption to develop three categories of government functions to explore variations in the performance of ministries

on the Layne and Lee Stages model of e-government development. In this study, the functions are (for purposes of exploration) grouped into three categories: administrative and regulatory, services, and development ministries.

The Stages models literature suggests that, theoretically, e-government is expected to grow in progressive stages. Each stage is expected to be at a successively higher level on the information, communication, and transactional scale. However, websites, where these attributes should be found, have varying features representing each dimension in many cases. One viewpoint is that the informational and communication features tend to emerge in the early Stages of the e-government implementation process, then followed by the transactional (interactivity) features in the later phases of implementation (Layne and Lee, 2004). For example, Katz and Phillips (1982) showed that in the early Stages of e-government, the basic informational attributes tend to predominate, with the communication and interactive features appearing only in the later stage. Studies by Fleck (1983, 1988) on the Stages of growth of e-government demonstrated the pattern of the early informational websites, followed by the interactive and communication features in the subsequent stage. It is hypothesized that the websites process of attribute development is characterized by this pattern. Therefore, hypothesis 2 is stated as:

> **Hypothesis 2:** Based on the pattern predicted by the Layne and Lee Stages model, there are will be higher scores for earlier Stages of e-government than for later stages.

The Stages model literature suggests that, theoretically, e-government is expected to grow in progressive stages. Each stage is expected to be at a successively higher level on the information, communication and transactional scale. However, websites, where these attributes should be found, have varying features representing each dimension. One viewpoint is that the informational and communication features tend to emerge in the early Stages of the e-government implementation process, followed by the transactional (interactivity) features in the later phases of implementation (Layne and Lee, 2004). For example, Katz and Phillips (1982) showed that in the early Stages of e-government the basic informational attributes tend to predominate, with the communication and interactive features appearing only in the later stage. Studies by Fleck (1983, 1988] on Stages of growth of e-government showed this pattern of the early informational websites, followed by the interactive and communication features in the subsequent stage. The process of web attributes development is expected to follow this pattern. Ministries and other government agencies' websites will, typically, start with basic information content, usually reproducing information already held in traditional formats. It is hypothesized that there will be higher scores for the informational content (Catalogue Stage) of the websites than for succeeding Stages. It is also expected that there will be progressively lower scores for subsequent Stages of e-government development according to the model's predictions.

3.3: Data Collection and Instrumentation

This section describes the data collection and the content analysis coding scheme. Content analysis is a method used to examine the content of communication texts and messages. Researchers in the field of mass communication primarily use content analysis to study how messages contained in mass-mediated and public texts, such as public speeches and media text in newspapers, are portrayed. Berelson (1952) defines content analysis as “a research technique for the objective, systematic and quantitative description of the manifest content of communication.” Weber (1990) described content analysis as “a research method that uses a set of procedures to make valid inferences from text."

Content analysis can provide insight about communication texts and is, thus, appropriate for this study since it allows the exploration of the supply side of information and communication which contributes to the relationship between citizens and their governments. As e-government is an attempt to deliver services and perform functions using new advanced information and communication technologies, a content analysis is an effective method of evaluating e-government in practice. While it was not within the scope of this study to examine citizen use of e-government services, the content analysis of government ministry websites enables us to make prospective observations about government-citizen communication.

3.3.1: Content Coding Scheme

This study used the Web Attribute Evaluation System (WAES) for content analysis of government ministry websites. A coding scheme used to classify and translate content into sets of meaningful categories to provide the researcher with an account of the

underlying message is central to any content analysis. The Web Attribute Evaluation System (WAES) coding scheme was assessed for whether it meets the criteria for a valid coding scheme. In other words, it was assessed for whether it can be accurately and consistently applied to reproduce the research categories that are mutually exclusive, exhaustive and reliable; and, whether the different coders agree on the categories for the data (Krippendorff, 1980; Wimmer and Dominick, 1994).

Three categories in the coding scheme amply capture the content that represents the functionalities needed for websites to satisfy criteria for the respective Stages of e-government in the Layne and Lee Stages model. Their basic features, generally and broadly defined, include information provision, communication, and interaction. These three categories, included in the coding scheme coding sheet, have been identified in the literature as effective indicators of e-government (e.g. Norris, 2004; La Porte et. al, 2004; West, 2001). They evaluate the information, communication, and interaction characteristics of website content (see Appendix 1 for Code Sheet).

The coding scheme quantified types of content, functional features, and integrative qualities found on a ministry website. The typology developed in the literature and, in particular those referencing the Web Attribute Evaluation System (WAES), provided the initial framework for developing this coding scheme. Earlier studies that examined e-government sites in other countries using the Web Attribute Evaluation System were also used as a baseline for developing the coding scheme (La Porte et al., 2002; Ho, 2002; Moon, 2002). The coding categories were for items representing the four Stages of e-government (as identified in the Layne and Lee Stages model of e-

government): Catalogue, Transactions, Vertical Integration and Horizontal Integration. Because of the exploratory nature of this study, the coding scheme included a varied number of items for each category that reflected the different types of indicators used for the selected types of content and functionalities (see Table).

3.3.2: Coding and Intercoder Reliability

Like other previous studies that analyzed web content (see for example: La Porte et al., 2000; Ho, 2002; Moon, 2002), this study included the categories coded by noting the presence or absence of a coding item. Because websites were examined in detail, it was important to ensure inter-coder reliability. Two coders examined 10 websites to test the validity of the coding instrument and obtain a measure of intercoder reliability, and found an intercoder-reliability score of 93.87 using Holsti's (1969) formula (one among several different coding methods). Holsti (1969) presented a formula for determining the reliability of nominal data in terms of a percentage agreement derived from the number of coding decisions on which the coders agreed divided by the total number of the coders' decisions. This score is sufficient to demonstrate the reliability of the findings (Wimmer & Dominick, 2003). Some coding items were modified, and definitions for controversial variables were clarified. Coders analyzed all 46 ministry websites. The coding was conducted during the months of May and June 2009.

The units of analysis are individual ministries' e-government websites. The ministry websites as a new avenue for communication between the ministry and its customers (including citizens, contractors and business partners), is expected to contain information about and links to the services provided by the ministry. Among other

functionalities, the ministry websites are assumed to provide information on current services of the ministry at all levels, opportunities for citizens to contact officials, and get some feedback, and to complete transactions online. Websites are expected to reproduce information and services previously provided through traditional methods on the web and to closely disseminate the functions and activities of the government ministries as clearly defined on paper.

3.3.3: Coding Instrument: Web Attribute Evaluation System (WAES)

The CyPRG's Web Attribute Evaluation System (WAES) (a research instrument which provides measures of e-government functions on three categories: information, communication, and transaction), was used to generate data on the presence and types of content of websites. Each category has a number of items that measure different indicators of e-government functions.

The instrument for evaluating ministry websites for this case study consisted of 35 indicators of the presence of web content and attributes, and this was a measure of the stage of e-government attained. The 35 items represent, respectively, the catalogue, transactions, vertical, and the horizontal integration stages. The coding items were divided into 10 items for the catalogue stage, 13 items for the transactions stage, 7 items for the Vertical Integration stage, and 5 items for the horizontal integration stage. Table 1 below shows the selected coding items for each respective stage of e-government.

Table 1 Summary of Coding Items by Stages

Catalogue	Transactions	Vertical Integration	Horizontal Integration
1.Official's vision of the future of the ministry 2. Ministry's mission statement 3. Org. chart 4.Addresses for other government/non-government agencies (issue or non-issue-related) 5. Laws/published material posted on website 6. Searchable index for archived documents e.g. newsletters and reports 7. All downloaded/printed publications for free 8 Link to/text of public information, law or regulation	1.Provides ministry's contact information e.g. non-email addresses 2. Provides phone numbers for employees and senior officials 3. Provides required submission forms onscreen for download 4. Provides for online form completion and submission 5. Provides automatic reply notifying expected time of response from the agency 6. Provides email clickable link to senior officials and employees 7. Online issue-related forum for outsider participation 8. Automatic updates or newsletters via subscription 9.Link to outside government addresses 10. Online form completion/submission	1. -provides link to listed sub-elements within agency 2. provides link to sublevels noted in ministry's org chart 3.provides link to outside issue-related government addresses 4. provides link to outside non-issue-related government addresses 5.provides link to outside issue-related non-governmental information sources 6. provides link to appeal process for decisions and/or an ombudsman 7. provides other language access to site for visitors unable to speak or read the language of the host country	1. Provides other issue-related addresses for other government agencies 2. Provides non-issue-related addresses for other government agencies 3. Provides link to outside issue-related government addresses 4. Provides link to outside non-issue-related government addresses 5. provides link to outside issue-related non-governmental information sources

For the catalogue stage, for example, the items generate information about the presence of a ministry's mission statement, which represents an official vision, plans, strategies, official publications, and information updates. On the transactions stage, data include contact information (postal, phone number addresses and e-mail addresses, links to email addresses for senior officials, instructions and guidelines for completing requirements for online services, discussion forum for citizens, online form submission, automated e-mail responses, and appeals procedures.

Directly relevant is the content analysis research into e-government using the WAES as a method for analyzing websites attributes. Approaches used to investigate e-government show that there are different ways in which it is conceptualized and evaluated. These approaches provide varying conceptualizations of e-government and its development. Previous studies of e-government have used the WAES method. Norris (2007) used the data from CyPRG's content analysis of government websites of 191 countries worldwide. The study examined the extent to which government websites facilitate the provision of official information about the agencies and their policies, the properties of interactive communication between public officials and related policy networks and, citizen interaction with the agency. The study further assessed progress in countries that were creating e-government, and it analyzed a range of explanatory factors in each country, including levels of human development, the strength of Internet penetration and the telecommunications infrastructure, and patterns of democracy. La Porte et al (1999) used the concept of governmental openness in a study of empirical correlates between factors such as education and the level of transparency and interactivity to be found on government websites. This study, a single government case study, examined factors that are peculiar to ministries, their types of services and their need for communication with their publics, as explanatory factors for the patterns of content found on their websites.

3.4: The Study Framework: e-Government Stages Models

The framework for this study is based on the Stages model of growth of e-government. The Stages of growth model suggests a descriptive way of analyzing e-

government. The model allows not only the classification of current or recent websites, but makes it possible to predict future trends. For example, if a website has all three core functionalities which enable citizen-government interaction such as basic informational content, interactivity, and transparency, it might be regarded as an effective tool to foster a stronger relationship between a government ministry and citizens.

A number of e-government models present different typologies of Stages of e-government development. Studies of e-government use these models for the evaluation of websites and online services provided by governments. These models have been used in a significant number of studies (Layne and Lee 2001; Wescott 2001; Baum and Di Maio, 2000; Ronaghan 2001; Hiller and Bélanger 2001) empirically examine websites to evaluate and provide representations of e-government in its various stages, from an initial web presence, to information provision, and to communication to interactivity.

Stage models of e-government have typically been descriptive, partly predictive, and partly normative. All claim to describe the evolution of e-government from its most basic element (a basic governmental presence on the World Wide Web) to fully developed e-government (with information, communication and interactive features allowing greater communication between citizens and government). The models are similar in most respects. They all predict the linear development or evolution of e-government from a basic online presence to full integration, seamlessness, and transformation. They all suggest or explicitly state that this development is progressive (each successive stage of e-government is better than the previous one) and proceeds in steps (governments have to proceed through each step in a series). The models predict

that e-government will move beyond information provision and interactivity to become fully transactional. They also predict that progressive Stages of e-government will significantly transform and improve relationship between governments and citizens. The models tend to become normative when describing a fully developed e-government, and they suggest what e-government should become. The models implicitly presume that fully transactional systems are better and that more citizen interaction equals improved service.

Studies using current experience are being conducted to examine the accuracy of these models and their predictions as well as the normative outcomes they suggest. Researchers have presented different models of the Stages of the evolution of e-government systems (Coursey and Norris, 2008; Calista and Melitski, 2007; Siau and Long, 2005; Belanger and Hiller, 2006). They all suggest that:

> …this development is progressive (each successive stage of e-government is better than the previous one) and stepwise (governments have to proceed through each step in a series). [17]

Five models proposed by different scholars, predicting steps for the development or evolution of e-government are described in Table 2 below. Coursey and Norris (2008) described the transformational final stage of e-government as "seamlessness, joined-up government, and finally, transformation…" Among the models describing different Stages in the evolution of e-government towards its full potential are Baum and Di

[17] Coursey, D. and Norris, D.F. (2008): Models of E-Government: Are They Correct? An Empirical Assessment. Public Administration Review, May2008, Vol. 68 Issue 3, p523-536, 14p

Maio's model (2000), Hiller and Belanger model (2001), Ronaghan's model (2001), and Wescott's` model (2001).

A summary of some of the models described above is presented below:

Table 2: The Models' Stages

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Layne & Lee (2001)		Catalogue	Transaction	Vertical integration	Horizontal integration	
Baum & Di Maio (2000)		Presence	Interaction	Transaction	Transformation	
Ronaghan (2001)	Emerging presence	Enhanced presence	Interactive	Transactional government	Seamless	
Hiller &Bélanger (2001)		Information dissemination	Two-way communication	Integration	Transaction	Participation
Wescott (2001)	E-mail and internal network	Inter-org. public access to info	Two-way communication	Exchange of value	Digital democracy	Joined-up government

Coursey, D. & Norris, D. F. (2008) Models of e-Government: Are they Correct? An Empirical Assessment, Diagram. *Public Administration Review*; May 2008, Vol. 68 Issue 3, p523-536

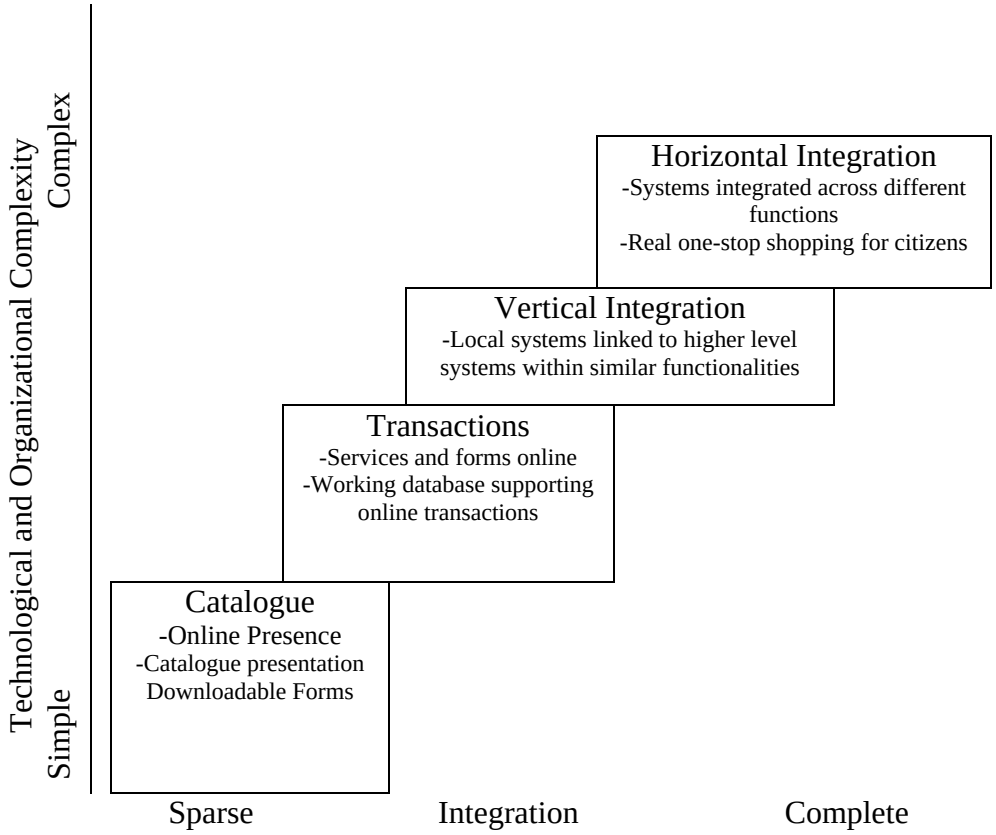
As can be seen in the table above, the Layne and Lee (2001) model predicted evolution from an *informational* (cataloguing) presence on the web to an *interactive* presence (transactions) with progressively more sophisticated *transactional* services and greater opportunities for citizen participation in government. The significance of this variation in the predicted evolution of e-government is the introduction of vertical and horizontal integration of e-government services. These involve services integration and data and information sharing between different levels of government. Layne and Lee (2001) introduced a third stage of e-government evolution, which is a Vertical Integration involving upper and lower levels of government sharing data and information online.

They also suggested a fourth (final) step in the model, horizontal integration, which means the sharing of data and information online across departments within governments.

The Layne and Lee model's stages, represented in Figure 1 below, include the catalogue stage (denoting basic informational presence), the transactions stage (online transaction and communication with government officials), the Vertical Integration stage (integration between higher and lower levels of a ministry), and finally to the horizontal integration stage (which brings together all parts of the government into one access portal across information and common services platforms). Normatively, these models also tell us that more e-government, which combines information, transactions and integration functionalities, is better because it is interactive, transactional, and integrated. The model's predictions are that e-government should (and would) be used by governments to provide for interactivity, transactions, and integration. Also, e-government should (and will) produce greater participation and a fundamental transformation in the relationship between governments and citizens.

The Layne and Lee Stages of growth model, the framework for this study is presented below:

Figure 1: Layne and Lee Four-Stage Research Model



Layne & Lee, (2001) Research Model: Dimensions and Stages of e-government development

Literature on e-government suggests that government-citizen relationship is enhanced by the introduction of online information, communication and transaction services (Moon, 2002; Moon and deLeon, 2001; Musso, et. al., 2000; Weare, et. al. 1999). Accordingly, the selection of the case study site, forty-six government ministries in Kenya, is based on the central role ministries play in the dissemination of information and the delivery of services for the population.

The study examined government services using the Stages model of e-government that suggests that progressive development of e-government services makes services more accessible to the population. As discussed earlier, researchers have applied different

models for evaluating e-government services through frameworks suggest varying Stages of development.

3.4.1: Stages Measures

This section details the four categories of indicators and measures that were used to evaluate websites. The indicators for the catalogue stage examine the presence of the ministry's mission and vision statement, the organizational structure (org. chart), addresses of other government ministries and entities, non-governmental information sources, laws, research publications, regulations, reports, searchable indexes for archived newsletters, laws, free downloaded or printed publications, and links to or text of public information, law or regulation. Transactions category indicators examine the presence of: officials' and other employees phone numbers, explanations of a ministry's requirements for citizens, instructions for citizens on how to perform those actions, government actions and appeals procedures, email addresses clickable link to senior officials, contact information of senior employees, online issue-related forums for citizen participation such as chat lines, listservs, automatic update announcements, newsletters via subscription, links to other government addresses, any required submission forms onscreen for downloading, and, online form completion and submission.

The Vertical Integration category examines the presence of links to listed sub-elements within ministries, links to sublevels listed in a ministry's organizational chart, links to other government addresses, links to non-governmental information sources, and appeals processes and procedures. The horizontal integration category examines the presence of addresses of other issue-related government ministries, non-issue related

addresses of other government ministries, links to other outside issue-related government addresses and non-issue related government ministry addresses and, links to issue-related addresses outside non-governmental information sources.

The measures are summarized in the table below. The table shows the categories of measures, representing the four stages, used in this study to evaluate websites' content. For each of the four stages, this research applies a different number of indicators, 10 items for the catalogue stage, 13 items for the transactions stage, 7 items for the Vertical Integration stage, and 5 items for the horizontal integration stage. The items measure the content in terms of the presence or absence of the particular attribute on the website ("1" for present and "0" for not present). For example, one indicator measures the presence of a ministry's mission statement on the website. The presence of this item is marked by a "1" and its absence marked by a "0" (see Table 3 below for a detailed definition of the items). The overall score under each category is standardized to a 100-point scale. This provides an equal weight to each of the four categories as a way to ensure that the research is not skewed in favor of a particular category since there are different numbers of questions in each category.

Table 3: E-Government Website Content Measures

E-government Stages	Number of Indicator Items	Potential Raw Score	Potential Weighted Score	Definition
Catalogue	10	"0" or "1"	100%	Online presence and some parts of the government's non-transactional information
Transaction	13	"0" or "1"	100%	Connecting the internal government system to on-line interfaces and allowing citizens to transact with government electronically
Vertical Integration	7	"0" or "1"	100%	Governments connected for different functions or services of Government
Horizontal Integration	7	"0" or "1"	100%	Integration of different functions and services across ministries
Total	35		100%	

3.4.2: Description of the Stages

Catalogue

The first part of the analysis examines the presence of different types of information on ministry websites in the areas representing the first stage of e-government development. This involves determining whether information available on the website satisfies the criteria for the catalogue stage. This includes information describing the ministry's functions, its vision for the future, strategic plans, and its organizational structure. In addition, the study examines the presence of other forms of information such as laws, research publications, regulations, reports and archived and searchable indexes that contain newsletters, and past reports in various formats.

Transactions

A critical component of e-government is the provision of ministry services online. This study examines services that allow citizens to interact with a ministry by way of

online communication, and services that allow citizens to complete transactions electronically, and those that provide downloadable transactions documents online. The interaction aspect implies interactivity and includes forms that allow citizens to request information or file complaints. Many governments across the world use advanced interactive services to allow citizens to obtain or provide information, to request services, and access ministry information online such as court records, education records, or medical records (Layne and Lee, 2001). The transactions aspect implies that ministries have the capacity to accept payment for services and taxes online, and can make it possible for forms to be completed electronically.

In this study, 13 indicators were selected from the WAES content code book to test the presence of transactional attributes. Transactional applications require a two-way exchange of data, as well as storage with examples of online job applications. At this stage the indicators help to determine whether citizens are able to complete transactions online and whether the ministry websites provide clear directions or citizens to follow. The indicators test whether: 1) ministry websites provide the means for citizens to complete transactions online 2) ministry websites provide downloadable forms and related application material 3) the websites have a feedback system for citizens to contact ministry officials and 4) ministry websites provide guidelines on completing the necessary transaction procedures.

Vertical Integration

The indicators for this stage test whether upper and lower levels of ministries are sharing information and data online. The indicators include links to listed subordinate

levels of the ministry; links to other parts and sub-agencies of the ministry as reflected in its organizational structure graphic; links to outside issue-related government addresses (sites) and links to other government information sources and to appeals processes.

Vertical Integration is an important phase in the progressive development of online communication for government-citizen interactions. Layne and Lee (2001) suggest that Vertical Integration enables citizens to fulfill government requirements online instead of having to go to a specific location to complete paperwork. According to this model, electronic transactions improve efficiency for both the citizen and the ministry. This stage is described as the beginning of the "revolutionary" stage of e-government that changes the way people interact with their governments. It empowers citizens to deal with their governments online anytime, saving hours of paperwork, of traveling to a government office, and of time spent waiting in line. Registering vehicles or filing state taxes online are only the beginning of such transaction-based services (Layne and Lee, 2001).

Horizontal Integration

Horizontal integration, the final stage, means the sharing of data and information across government ministries and departments. Horizontal integration focuses on integrating different functions from separate systems to provide users with a unified and seamless service. Layne and Lee (2001) suggest that the full potential of information technology, from the citizen's perspective, can only be achieved by horizontally integrating government services across different functional areas. This implies that databases across different functional areas will communicate with each other and share

information, so that information at one ministry will be accessible throughout all government ministries. Horizontal integration will facilitate "one-stop shopping" for the citizen.

At this stage, e-government provides integrated services and information through central points of delivery creating functional and cross-agency integration across government (Chan et. al., 2003; Ho, 2002). Five items were selected for testing for horizontal integration between ministries across the government. They include displaying issue and non-issue related addresses of and links to other government ministries and departments. Also included are links to issue-related non-governmental organizations. By displaying addresses and providing links to other government ministries and departments, a ministry facilitates access to services across the government that may either be related or unrelated to its own services.

3.5: Data Analysis

To examine and analyze the Stages of development and the content of Kenyan government websites in relation to services to citizens a number of assumptions were made. The first assumption was that the e-government strategy ensured that ministries were progressing stepwise towards higher Stages along the stage model framework. A second assumption was that e- government development would move from the provision of basic information, reflecting traditional forms of information dissemination, to full transactional e-government with websites meeting concrete benchmarks at each stage.

The study coded 45 websites established by Kenyan government ministries and which represented the whole range of central government services. The content was analyzed according to the four Stages criteria and, as earlier discussed, coding criteria

were selected that correspond with the requirements for each stage. This approach is consistent with the different understandings embodied in e-government literature about the contents of websites established by government agencies. Results from this analysis represent the characteristics and status of development of the Websites based on the coding items on the three dimensions of websites content. The analysis is an assessment that evaluates the Stages of e-government development, websites features, and their information, communication, and transactions services for citizens.

The coding schemes allowed the data generated to be statistically analyzed by using Chi-square test that uses data frequency counts. Since such tests would be limited in their ability to analyze differences among groups a Kruskal-Wallis test of differences was used to evaluate differences between the four e-government development Stages (Catalogue, Transactions, Vertical Integration, and Horizontal Integration). To understand thoroughly how the e-government functions across the governments in Kenya, the study adopted the method of counting the frequency for items developed in the coding scheme.

To answer the research questions, the study used two test statistics: Chi-Square and Kruskal-Wallis tests of significance. The Chi-square, a non-parametric test of statistical significance, was used to test hypotheses to determine whether or not ministries, grouped according to types of services and functions they perform, registered scores that were significantly different at different Stages of e-government. The purpose of this test is to determine whether types of services and functions performed has an effect on ministry scores based on the Layne and Lee e-government Stages model.

Chi-square was selected in this research because it accepts weaker, less accurate data as input than do parametric tests (like the t-test, and an analysis of variance) (Connor-Linton, 2003). In addition, it does not require the sample data to be more or less normally distributed in the population from which the sample is drawn (Connor-Linton, 2003). Data scores in this study are not normally distributed and show a negative skew. Chi-square, however, requires that data are in the form of raw frequency counts of phenomena in two or more mutually exclusive and exhaustive categories (Connor-Linton, 2003). The study used the Chi-Square Test to test whether ministries differ significantly in their progress along the Stages model scale.

The Kruskal-Wallis test was used to analyze and compare ministries' performance at each of the four Stages in the model, evaluate ministry standings, and determine ministry differences between the Stages of e-government development. The Kruskal–Wallis test has the advantage that it does not assume that the data are normally distributed. It does, however, assume that the observations in each group come from populations with the same shape of distribution. Data for this study were found to be negatively skewed, and have the same shapes (all except 1 skewed to the left) (Fagerland and Sandvik 2009).

The Kruskal-Wallis test is performed on ranked data, so the measurement observations are converted to their ranks in the overall data set in ascending order. The Kruskal-Wallis (KW) and the Mann-Whitney (MW) tests are to be used if the data is not normally distributed to determine the difference in means between two or more categories (independent groups in Kruskal-Wallis) or 2 categories (Independent groups in

Mann-Whitney test). Therefore they are the non-parametric versions of the ANOVA and the t-Test which should be used for parametric tests for normal distributions in particular.

Nonparametric procedures are based on ranked data. Data are ranked by ordering them from lowest to highest and assigning them, in order, values from 1 to the sample size. Ties are resolved by assigning tied values the mean of the ranks they would have received if there were no ties, e.g., 11, 13, 13, 19, 22 are ranked as 1, 2.5, 2.5, 4, and 5. Kruskal-Wallis test requires duplicate data readings to be reduced to an average between the two tied scores for purposes of rank ordering data. This however, only applies where there is a small data set. Since we have a large data set this requirement does not apply. Our data is mostly skewed to the left and in general the shapes of the distributions are similar, which is a requirement. The handling of the duplicate readings is of little concern in our case as we have a large data set (46) and have followed the established SPSS protocol.

The study took the mean score as a proportion of Yes ("1")/Total for all the 46 ministries across the four stages, i.e. the mean of the mean. It used the Kruskal-Wallis test to determine whether ministries' websites' develop according to the sequence predicted by the Layne and Lee Stages model for e-government development.

Chapter 4: Data Analysis

4.1 Introduction

This Chapter presents the data analysis and interpretation. A content analysis was done for 46 government ministry websites in Kenya from May through June of 2009. Data was analyzed using the Statistical Package for Social Sciences (SPSS) (PASW Statistics 18 version). Descriptive and inferential statistics such as frequency counts, tables, and tests of significance were used in the data analysis and summaries. Counts and percentage scores were cross-tabulated between variables and Chi-Square and Kruskal-Wallis tests were used to perform data analysis.

The data analysis was used to examine how the Lee and Layne Stages of growth model as a framework applies to the development of e-government in Kenya. The four-stage Layne and Lee (2001) model posits an evolutionary process that is expected to lead to improvements in government-citizen relations through online information, communication and services transactions. According to the model, government websites are predicted to develop progressively through Stages, beginning with delivering basic information (catalogue stage). At the second (transactions) Stage, e-government is expected to enable citizens to do some simple online transactions such as completing government forms. The Vertical Integration of government functions is the next Stage in this evolutionary process. This stage involves transforming government services by integrating government functions at different levels, such as those of local or subordinate levels of governments with the central government. This stage is followed by the horizontal stage, which brings together all the different functions from separate systems to provide users with a unified and seamless service.

In this study, the analysis focuses on:

- an evaluation of the findings about the current status of Kenya's ministry websites and a description of e-government Stages status;
- testing the Layne and Lee Stages model as it applies to Kenya government's ministries' websites based on the study data; and,
- examining and comparing government ministries' websites' content and attributes across the different stages.

4.2 The Research Model

In the research model shown in Figure 1, the variables are the Stages of e-government services development. The Stages are measured in terms of content found on ministries' websites that satisfy criteria for each stage. Two analytical methods were used to test the model's predictions.

In the first one, ministries are placed into three categories according to their functions. In an empirical study to explore the predictions on the evolutionary development of e-government, Coursey and Norris (2008) found variations in scores between types of functions and services offered on websites by municipalities in USA. They suggested that differences in scores between municipalities' websites might be associated with the types of services they provide and the functions they perform. A general assumption here is that websites are developed based on the functions and the service requirements of the agencies and institutions that establish them. For example, they found that some municipalities provided services like voter registration and offered online functionalities to support these services. Others have functions that are better served by information provision. On some municipalities' websites, financial transactions

online appeared to be a more significant functionality and were better developed, while in other cases, information and a wide range of non-financial services appeared to be a more dominant website feature. The study observed that the functions and types of services offered by a municipality might be associated with the pattern of development of e-government. Variations were observed in growth patterns between online transactional services and non-transactional services. These variations demonstrated that e-government development may be influenced by types of functions a ministry performs and by its services.

Based on these explanations, we assumed that government ministries can be grouped into functional categories. We tested scores in these groups to examine the possible influence their respective functions might have on e-government development. Accordingly, we assumed that functions that are purely administrative and regulatory are likely to necessitate fewer transactional services. Functions in the area of development such as the installation of infrastructure might require more informational services while government services like healthcare, procurement, or motor vehicle licensing might benefit from the convenience of online transactions.

As suggested by Coursey and Norris (2008), we assumed that ministries' functions influence the type of information, communication and online transactional services they provide on their websites. We used this assumption to develop three categories of government functions to explore variations in performance of ministries on the Layne and Lee Stages model of e-government development. In this study, the functions are, for purposes of exploration, grouped into three categories as follows:

administrative and regulatory, services, and development ministries. Table 1 in Appendix 3 is a list of ministries in each category. A Chi-Square analysis is conducted using mean scores for each category to determine differences, if any, between the categories across the model Stages of e-government development. The test is used to explore possible associations between ministry functions and the Stages of e-government development.

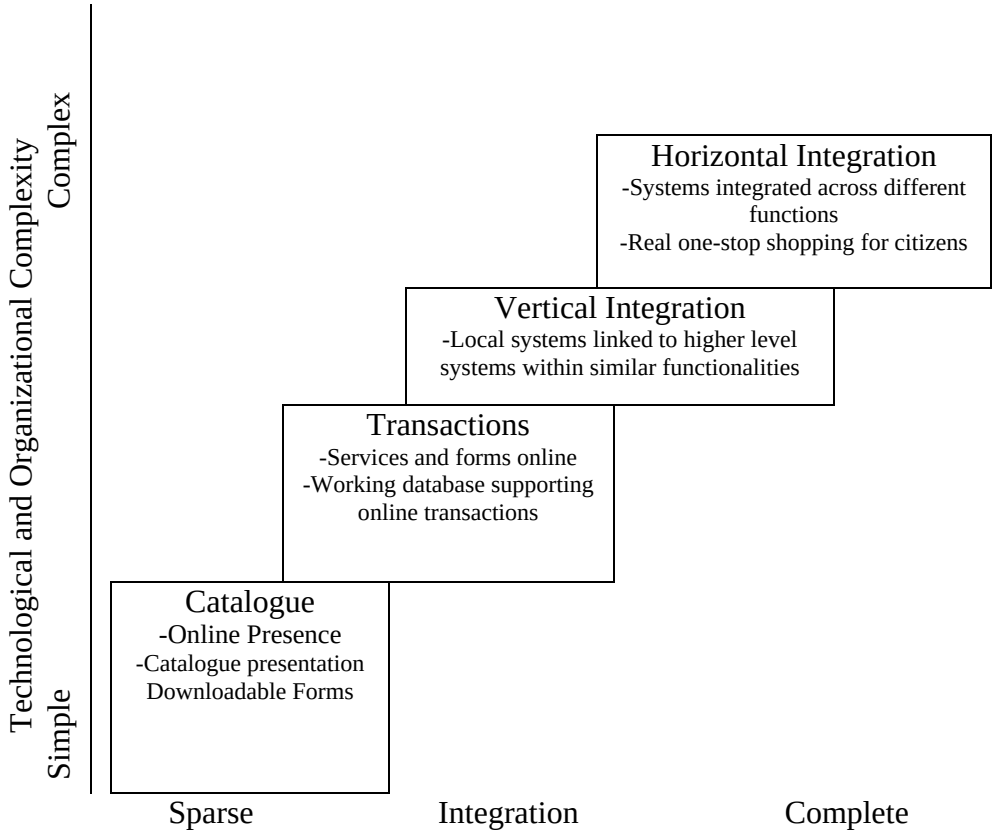
The second approach is a comparison of the Stages' performance for all ministries across the model Stages of e-government development. As suggested in studies of e-government, a number of Stages models of e-government have been used in empirical studies to assess whether their predictions hold true as governments establish websites to enhance communication with and services for citizens. As observed in these assessments (Coursey and Norris, 2008; Heeks and Bailur, 2007; Yildiz, 2007; Reddick, 2003), most models predict a linear progression from a basic online presence to full integration, seamlessness, and transformation. Most models predict the linear evolution of e-government. They all suggest that this development is progressive (each successive stage of e-government is better than the previous one) and stepwise (governments have to proceed through each step towards better government-citizen communication

As previously stated, the Layne and Lee (2001) model predicts that e-government will move beyond information provision and interactivity to become fully transactional and progress to vertical and horizontal integration. The model also predicts that e-government will fundamentally transform the relationship between governments and citizens. The model implicitly presumes that fully transactional systems are better and that more citizen interaction equals improved service.

The Layne and Lee (2001) framework, used in this study, suggests that the four step e-Government development 'Stages of growth' model leads to a fully functional e-Government. Figure 1 (below) shows the four Stages in the Layne and Lee (2001) model. The model describes progressive Stages of website development, as well as the content and attributes at each respective Stage required for fully functional e-government. Counts of scores at these four Stages represent progressive complexity as e-government evolves. Higher frequency scores for a ministry website or total scores for a group of ministries within a functional category indicate the extent criteria for each stage have been met.

The model is shown in Figure 1 below:

Figure 2: Dimensions and Stages of e-Government



Source: Layne & Lee, (2001) Research Model: Dimensions and Stages of e-government development

4.3 Research Questions and Hypotheses

The study is a test of whether government ministries' websites have the features suggested by the model of e-government and whether they satisfy the criteria for the Stages predicted by the Layne and Lee model for the evolution of e-government. To test these predictions, the study set out to answer the following research questions:

Research Questions

RQ 1: Using the Layne and Lee Stages model as a framework, are some types of ministries advancing faster than others through the Stages of e-government development based on their types of functions and services

RQ 2: Do Kenyan government ministries' websites develop according to the sequence predicted by the Layne and Lee Stages model for e-government development?

Hypotheses

The hypotheses tested in this study are used to examine the patterns of e-government development at two levels. We test the differences between ministries grouped in functional categories at the first level. In the second test, we examine and compare scores between ministries at the four model Stages of e-government. The first test follows the assumption that ministries' function types can influence the content and functionalities found on a website. The second test is based on the Layne and Lee model prediction that ministries are expected to have higher scores in the earlier Stages of e-government development than in the later stages. This is because of the expected tendency for e-government to evolve from information provision to progressively more

complex services. Scores are, for these reasons, expected to decline through the successive Stages of e-government development.

This research model enables us to compare functional group data scores (Hypothesis 1) and, ministries' performance across the Stages (Hypothesis 2) to assess incremental progression predicted in the Layne and Lee model. The two hypotheses tested to answer the research questions in this study are:

Hypothesis 1: There will be differences in score counts between ministries across the Layne and Lee Stages of e-government development based on their functions and types of services.

Hypothesis 2: Based on the pattern predicted by the Layne and Lee Stages model, there are will be higher scores for earlier Stages of e-government than for later stages.

4.4 Data Analysis

The study focused on websites established by Kenya government ministries as a sample. Kenyan government websites were selected as a case study to explore the predictions of the Layne and Lee e-government model. The procedure used to process data was based on the guidelines provided by the coding instrument, the Web Attribute Evaluation System (WAES) (CyPRG, 2001). These guidelines were used to select a number of coding items from WAES codebook that has been used in a number of studies to evaluate e-government development worldwide ((Demchak, et al., 2000; Esteves &

Joseph, 2008; Holzer and Melitski, 2003; La Porte et. al., 2000). The coding items used in this study were selected based on their relevance to the focus and study framework.

Data obtained from 46 ministry websites were analyzed to answer study questions and to test hypotheses. Data analysis was based on totaling counts of coded content present in each category. Counts of content scores in each category were analyzed to determine the Stages of e-government development reached by the different ministries.

Content analysis scores for all 46 Kenya government ministry websites were included in the study. We used quantitative content analysis as a method for testing and measurement based on the assumption that the WAES' validity is founded on tested protocols that can be used for empirical validity. Content analysis is, for this reason, an appropriate method for the study of a government's use of online communication to enhance service delivery and improve its relationship with citizens.

According to Berelson (1952), QCA is a suitable method for the objective and quantitative description of the manifest content of communication. Accordingly, we segmented website content into indicator items and assigned each indicator item into categories representing four aspects of selected online communication variables: information, interaction, Vertical Integration and horizontal integration. Counting scores for the presence of wholly manifest content of government websites provides empirical evidence for the hypothesized contribution of government websites to the improvement of communication, services delivery, and government-citizen relationships.

The Layne and Lee model Stages of e-government allow us to develop constructs that contain the communication attributes that can, cumulatively, constitute a fully-

functional e-government. It is possible to make some inferences and describe the status of e-government attained by ministries in the study. We tallied counts of selected items of content to evaluate the extent to which a ministry website satisfied the criteria for the constructs that represent information, interaction, Vertical Integration, and horizontal integration.

Table 3 in Appendix 1 contains a schedule of coding items used in this study as indicators of the Stages of e-government development. For measurement, we assigned the numbers “1” and “0” to represent presence or absence of web content or a specific functionality respectively. In the content analysis, 1 represents the presence of a feature or attribute while 0 represents its absence.

As a communication study, the focus is on the communication value of the manifest content represented by content and types of functionalities found on ministry websites. For example, the presence of more information on ministry websites signifies increased access and better citizen understanding of government processes and actions. The presence of online interaction attributes means citizens can interact with and transact business with government agencies conveniently. Evidence of Vertical Integration suggests that services and information are integrated between central and lower divisions of government ministries.

Table 4 below shows the content measures assigned to each e-government development stage, the 35 indicator items corresponding with each stage, the raw scores, and the stage of e-government services reached.

Table 4: Content Measures for Layne and Lee Stages Model

E-government Stages	Number of Indicator Items	Potential Raw Score	Potential Weighted Score	Definition
Catalogue	10	"0" or "1"	100%	Online presence and some parts of the government's non-transactional information
Transaction	13	"0" or "1"	100%	Connecting the internal government system to on-line interfaces and allowing citizens to transact with government electronically
Vertical Integration	7	"0" or "1"	100%	Governments connected for different functions or services of government
Horizontal Integration	7	"0" or "1"	100%	Integration of different functions and services across ministries
Total	35		100%	

4.5 Review of the Data

Stages of e-Government Development: Differences between Ministries

Table 5 below shows data and statistics for the three functional categories at all four Stages of development. As can be observed from the mean scores across all the functional categories, the Catalogue stage has a higher mean score than the three other stages. A comparison between the three functional categories reveals a higher mean score at all the Stages for the development category than for the other categories (e.g. mean scores of 85.00 compared to 74.62 and 68.95 for the services and administrative categories at the Catalogue stage).

Table 5: Descriptive Statistics- Stages Scores by Functional Category

	Stages	N	Range	Min.	Max	Mean	Std. Dev
Admin/Reg	1	19	100	0	100	68.95	27.263
	2	19	85	0	85	43.68	25.115
	3	19	86	0	86	45.79	25.374
	4	19	100	0	100	56.84	36.064
Service	1	13	100	0	100	74.62	28.465
	2	13	92	0	92	50.23	29.858
	3	13	86	0	86	52.77	23.555
	4	13	100	0	100	70.77	37.072
Dev	1	14	100	0	100	85.00	27.666
	2	14	100	0	100	60.50	29.380
	3	14	86	0	86	57.21	26.828
	4	14	100	0	100	80.00	31.379

Table 6 shows ministry website statistics by stages. Again, the mean scores reveal a higher performance by ministries at the Catalogue stage than at the successive model stages. This shows that most ministries follow the model pattern and establish more information content as the starting point before introducing other functionalities, such as transactions (online applications, payments). The Layne and Lee model suggests that websites will provide more information content at the initial (Catalogue) stage.

Table 6: Ministry Score Counts by Stages

	Stages			
	Catalogue	Transactions	V/Integration	H/Integration
M	75.43	50.65	51.24	67.83
SD	27.945	28.109	25.254	35.647
Median	85.00	54.00	57.00	80.00
N	46	46	46	46

Table 7 is a summary comparison of scores for the different functional categories of ministries websites at the four Stages of the model. According to Coursey and Norris (2008), functions performed by and services delivered by ministries can be associated with the type of web content and functionalities to be found on ministries' websites. According to this assumption, it was observed that the administrative and regulatory ministries category had less information than both the development and service categories. It had overall lower scores at all Stages than the development and services Stages.

Online communication is associated with information, interaction and integration. We conclude that administrative and regulatory ministries have fewer direct interactions with citizens, and therefore need less functionality for communication and interaction than development and service ministries. This can be explained by the fact that the functions of administration and regulatory are, by nature, less service and communication oriented than development and service functions.

Table 7: Ministries' Stages Mean Scores by Functional Category

	Functional Groups		
Stages	Adm/Reg	Dev.	Services
Catalogue	68.95	85.00	74.62
Transaction	43.68	60.50	50.23
Vertical Integration	45.79	57.21	52.77
Horizontal Integration	56.84	80.00	70.77
N	19	14	13

4.6 Procedures for Testing the Hypotheses

To answer the research questions, we used two test statistics, the Chi-Square and the Kruskal-Wallis tests of significance to test the hypotheses. The Chi-square, a non-

parametric test of statistical significance, was used to test hypotheses to determine whether or not ministries, grouped according to types of services and functions they perform, registered scores that were significantly different at different Stages of e-government. The purpose of this test was to determine whether types of services and functions performed has an effect on ministry scores based on the Layne and Lee e-government Stages model.

Chi-square was selected in this research because it accepts weaker, less accurate data as input than do parametric tests (like t-test, and analysis of variance) (Connor-Linton, 2003). In addition, it does not require the sample data to be more or less normally distributed in the population from which the sample is drawn (Connor-Linton, 2003). Data scores in this study are not normally distributed and show a negative skew. Chi-square, however, requires that data are in the form of raw frequency counts of phenomena in two or more mutually exclusive and exhaustive categories (Connor-Linton, 2003).

We use the Chi-Square Test to test whether ministries differ significantly in their progress along the Stages model scale. Hypothesis 1 stated that there will be differences in score counts between ministries across the Layne and Lee Stages of e-government development based on their functions and types of services.

The second test used in this study is the Kruskal-Wallis test. It is used to analyze and compare ministries' performance at each of the four Stages in the model, evaluate ministry standings and determine ministry differences between the Stages of e-government development.

The Kruskal–Wallis test has the advantage that it does not assume that the data are normally distributed. It does, however, assume that the observations in each group come from populations with the same shape of distribution. Data for this study were found to be negatively skewed, and have the same shapes (all except 1 skewed to the left) (Fagerland and Sandvik 2009).

The Kruskal-Wallis test is performed on ranked data, so the measurement observations are converted to their ranks in the overall data set in ascending order. The Kruskal-Wallis (KW) and the Mann-Whitney (MW) tests are to be used if the data is not normally distributed to determine the difference in means between two or more categories (independent groups in Kruskal-Wallis) or 2 categories (Independent groups in Mann-Whitney test). Therefore they are the non-parametric versions of the ANOVA and the t-Test which should be used for parametric and for normal distributions, in particular.

Nonparametric procedures are based on ranked data. Data are ranked by ordering them from lowest to highest and assigning them, in order, values from 1 to the sample size. Ties are resolved by assigning tied values the mean of the ranks they would have received if there were no ties, e.g., 11, 13, 13, 19, 22 are ranked as 1, 2.5, 2.5, 4, and 5. The Kruskal-Wallis test requires that duplicate data readings be reduced to an average between the two tied scores for purposes of rank ordering data. This however, only applies where there is a small data set. Our data is mostly skewed to the left and in general the shapes of the distributions are similar, which is a requirement. The handling of the duplicate readings is of little concern because we have a large data set (46) and have followed the established SPSS protocol.

We took the mean score as a proportion of Yes ("1")/Total for all the 46 ministries across the four stages, i.e. the mean of the mean. We used the Kruskal-Wallis Test to test whether ministries' websites' develop according to the sequence predicted by the Layne and Lee Stages model for e-government development. Out test Hypothesis states that:

> Based on the pattern predicted by the Layne and Lee Stages model, there are likely to be (will be) higher scores for earlier Stages of e-government than for later stages.

4.7 Results and Findings

4.7.1: Chi-Square Tests

The results of all Chi-square tests are reported below. For the Chi-Square test, the ministries were grouped into three different types of functional groups: administrative and regulatory (19 ministries), services (13 ministries) and development (14 ministries). The four Stages of growth, the study variable, included: catalogue, transactions, Vertical Integration and horizontal integration. Table 8 below shows the score counts representing each functional category into which the ministries are grouped.

Table 8: Chi-Square Test Score Counts

Ministries by Functional Categories		Stages			
		1 Catalogue	2 Transactions	3 Vertical Integration	4 Horizontal Integration
Admin/Reg.	Y	142	105	60	53
	N	48	142	73	42
Service	Y	99	83	48	46
	N	31	86	43	19
Development	Y	118	109	56	56
	N	22	73	42	14

The Chi-square test was used to assess whether scores varied significantly across the Stages between ministries' functional categories. We compared counts for the presence of website content ("Yes" scores) at each stage by grouping ministries into functional categories. Coursey and Norris (2008) suggested that differences in the types of functions performed by ministries or other government agencies tended to influence the type of content to be found on websites. They suggested that the delivery of online services (beyond providing basic information) varies considerably for these reasons. For example, non-transactional and non-financial services, according to this view, were more likely to be found on websites than were transactional and financial services. Based on this view, we divided ministries into categories based on types of functions they performed to determine whether there were differences between there scores at different e-government stages. As hypothesized, we expected that the scores by ministries at each stage would vary by the functional category the ministry was grouped in. Table 9 below shows data for statistical differences between ministries grouped as functional categories at each stage of e-government.

Table 9: Chi-Square Score Differences between Categories

	Stages			
	Catalogue	Transactions	Vertical Integration	Horizontal Integration
Pearson Chi-Square	4.667	12.690	3.435	12.197
Df	2	2	2	2
Asymp. Sig. (2-sided)	0.097	0.002	0.179	0.002
Statistical Difference between Functional Groups	NO	YES	NO	YES

The results of the test are significant at the transactional and horizontal integration Stages. However, there is no statistically significant difference observed for the catalogue and Vertical Integration Stages. This is likely because the target implementation priority for e-government development has so far remained the central government, in Kenya's case, where most policy and administrative action is centered. This means that lower levels of government have yet to develop websites and exercise some autonomy in online service delivery and communication. Accordingly, little can be expected by way of Vertical Integration. On the other hand, government ministries have developed some degree of online information and there appears to be no difference, for the catalogue stage, in the level of information availability.

This leads to the conclusion that functions and types of services performed by ministries generally influence the development of websites, as in the case of transactional and horizontal integration Stages. However, this influence on website content is not very

significant in some ministries, as in the example of catalogue (information) and Vertical Integration Stages. To further explore the study model's predictions, ministries scores are compared across the four Stages of e-government development using the Kruskal-Wallis test.

4.7.2: Kruskal-Wallis Test

A Kruskal-Wallis test was conducted to evaluate differences between the four e-government development Stages (Catalogue, Transactions, Vertical Integration, and, Horizontal Integration) on median scores on the content and attributes found on ministries' websites. This was to answer the question of whether the median scores for the Stages of e-government development differ between administrative and regulatory, development, and, services ministries. The test also aimed to answer the question of whether the median scores for ministries differ between the four Stages of e-government development.

The Kruskal-Wallis test does not require that the dependent variable has a normal distribution. However, it does assume that the distribution of the dependent variable has approximately the same shape in each of the groups, which implies that the variance is approximately equal across the groups. The Kruskal-Wallis test reveals any significant differences among the medians of two or more groups.

Table 10 shows the ranking scores of the four Stages of e-government. The results of the analysis indicate that there is a significant difference in the medians: $x^2(3, N = 184) = 29.41, p = .000$. Because the overall test is significant, pairwise comparisons among the four Stages was completed. The ranking shown in Table 10

reveals higher scores at the catalogue stage followed by progressively lower scores for the next three stages. As is later shown on Table 11 there is a statistically significant difference in the mean ranks between the four Stages of e-government.

Table 10: Ministry Mean Scores by Stages

	Stages	N	Mean Rank
Stages	1	46	118.53
	2	46	71.41
	3	46	71.78
	4	46	108.27
	Total	184	

Table 11: Test of Significance differences between Stages[a, b]

	Stages Pct
Chi-square	29.411
Df	3
Asymp. Sig.	.000

a. Kruskal Wallis Test; b. Grouping Variable: StagesDig

Pairwise comparisons were conducted using the Mann-Whitney test, which provides identical results with the Kruskal-Wallis test for two independent samples. The results of these comparison tests indicated a significant difference between the Catalogue Stage (Stage 1) and Transactional Stage (Stage 2). There is also a significant difference between Stages 1 and 3 (Catalogue and Vertical Integration Stages respectively). A significant difference was also observed between the Transactions Stage (Stage 2) and Horizontal Integration Stage (Stage 4), and, Stages 3 and 4 (Vertical Integration and Horizontal Integration Stages). These differences in scores between the Stages show ministries following somewhat different patterns in e-government development with varied scores at each of the Stages of e-government development. However, there is a higher score at earlier than at later stages.

Table 12 below shows the results of the tests of significance for the differences between the four e-government stages. There is a statistically significant difference between the Catalogue and Transactions Stages (0.000), Catalogue and Vertical Integration Stages (0.000); Transactions and Horizontal Integration Stages, and, the Vertical and Horizontal Integration Stages.

Table 12: Mann-Whitney Post-Hoc Tests of Significance

Stages	1 Catalogue	2 Transactions	3 Vertical Integration	4 Horizontal Integration
1 Catalogue	-	0.000	0.000	0.562
2 Transactions	0.000	-	0.748	0.002
3 Vertical Integration	0.000	0.748	-	0.001
4 Horizontal Integration	0.562	0.002	0.001	-

4.7.3: Hypothesis Test Results

Hypothesis 1

Hypothesis 1 stated that there would be differences in score counts between ministries across the Layne and Lee Stages of e-government development, based on their functions and types of services. As observed earlier, Table 5 summarizes the count of scores related to the Stages of website development and e-government service delivery performance. The results show that score counts (of "Yes" or "1") for the Catalogue stage were significantly greater than scores at the Transactions, Vertical Integration and Horizontal Integration Stages for all the three functional categories. This means that for

all the three functional categories, the Catalogue stage is significantly better developed than the successive three other stages. However, as shown by statistical results on Table 13, there are significant differences between the functional groups of ministries from the results for the Transactions and Horizontal Integration stages. This finding suggests that, as e-government development continues, scores for some Stages might be significantly different depending on types of services and functions performed by ministries.

Table 13:Chi-Square Tests of Significance Differences between Categories

	Stages			
	Catalogue	Transactions	Vertical Integration	Horizontal Integration
Pearson Chi-Square	4.667	12.690	3.435	12.197
Df	2	2	2	2
Asymp. Sig. (2-sided)	0.097	0.002	0.179	0.002
Statistical Difference between Functional Groups	NO	YES	NO	YES

Hypothesis 2

Hypothesis 2 stated that there are likely to be (will be) higher scores for earlier Stages of e-government than for later stages. Overall, the statistical significant difference between the functional categories of ministries at some Stages of e-government, coupled with the pattern of higher to lower scores from the Catalogue stage to other Stages confirms the model prediction that e-government development starts with basic static information before other more complex functionalities such as transaction and integration, are developed. According to the statistics, the Catalogue stage has overall

higher scores than all the other Stages, confirming the model's prediction that earlier Stages of e-government development have higher scores than later stages.

Table 14 summarizes the results of the tests of significance for the differences between the four e-government stages. The results show a significant difference between the Catalogue stage (Stage 1) and the Transactions (Stage 2). There is also a significant difference between Stages 1 and 3 (Catalogue and Vertical Integration). A significant difference was also observed between the Transactions Stage (Stage 2) and the Horizontal Integration Stage (Stage 4) and between Stages 3 and 4 (Vertical and Horizontal Integration). These results confirm that earlier Stages of e-government have higher scores. Scores also decline as e-government progresses through the stages.

Table 14: Mann-Whitney Post Hoc Tests of Significance

Stages	1 Catalogue	2 Transactions	3 Vertical Integration	4 Horizontal Integration
1 Catalogue	-	0.000	0.000	0.562
2 Transactions	0.000	-	0.748	0.002
3 Vertical Integration	0.000	0.748	-	0.001
4 Horizontal Integration	0.562	0.002	0.001	-

Chapter 5: Findings, Conclusions and Implications

5.1: Introduction

The final chapter of this dissertation is an aide to the reader. It provides a brief overview of the study, including a statement of the problem and the major methods used. It first summarizes how the results of the study answered the research questions and how it relates to the study framework. The chapter is, in part, a summary and discussion of the study hypotheses and a discussion of the relevance of the results for the concept of e-government, its evolution, and in particular, it's potential as a new communication medium for the transformation of relationships between governments and their citizens in developing countries. The conclusions section discusses how to apply the lessons learned from this study to the e-government development Stages model process. The final section discusses opportunities for further research in this area.

5.2: Summary of the Problem and Methodology

The adoption of electronic government has spread fast across the world in the last decade. In Africa, as in other developing countries, e-government has been seen as a panacea for government transformation. The Division for Public Administration and Development Management, a division of the United Nations Department of Economic and Social Affairs (UNDESA), suggests that e-government has great potential for public sector transformation in Africa (UN, 2008). In its e-Government survey, published annually, the UN describes e-government as a means not only to provide citizen with services, but to increase public sector efficiency, in addition to improving transparency and accountability in government functions and allowing for cost savings in government

administration. Further, the UN describes a trend toward transforming government from a focus on providing information and services to citizens (through separate and parallel service delivery platforms across various government agencies), to an integrated model that creates seamless spaces for interactions with governments. The former model retains the traditional service delivery system built around individual agency functions, structures, information, systems and capabilities, while the latter transforms the system.

Like other developing regions, Africa has adopted e-government with the support of advanced countries and other international development partners. It is a resource increasingly being mobilized to transform government in developing countries. The assumption is that e-government is ideally situated to facilitate the transformation of government services delivery, to improve relationships with citizens, and to play an important role in providing key information. It will also contribute to greater citizen participation in government decisions. A transformation of relationships between governments and citizens in an information-driven environment is seen as an opportunity for developing countries (I.B.R.D. World Bank, 2002) still facing challenges with regard to citizen participation in government (U.N., 1997).

In spite of this important role of e-government, however, most research on has focused on the number of countries adopting e-government, countries with online services and their comparative ranking, rather than content and functionalities that enable communication with citizens. Only very few studies have examined the current and future status of the content of e-government in relation to its potential effectiveness in facilitating government citizen relations (UNESC, 2003). In general, there appears to be

an implicit assumption on the part of researchers, policy makers and government workers that government websites will, regardless of their content and functionalities, fulfill the purposes of services delivery and access to information.

Most, if not all, e-government strategies and implementation plans in developing countries have been based on theories and experiences of developed countries (Huang, D'Ambra and Bhalla, 2002). External pressure to provide e-government services led many developing countries to hastily undertake e-government implementation by following e-government development strategies which were proposed and carried out by developed countries. However, due to substantial differences in many key aspects of e-government and related technological and social conditions, e-government development strategies and experiences of developed countries may not be directly applicable to developing countries. Many undesirable outcomes of e-government projects can be explained by this experience (Heeks, 2000).

Sub-Saharan Africa remains comparatively behind the rest of the world, according to the UN e-Government Readiness Index (UNDESA, 2008). The difference between the five regions shows Europe (0.6490) having a clear lead over the other regions, followed by the Americas (0.4936), Asia (0.4470), Oceania (0.4338), and Africa (0.2739). Asia and Oceania are slightly below the world average (0.4514), while Africa lags far behind.[18]

The overall purpose of this study was to examine the process and further explore the progress of e-government implementation in a developing country context and how

[18] UN Department of Economic and Social Affairs Division for Public Administration and Development Management United Nations e-Government Survey 2008 From e-Government to Connected Governance

this may contribute to improving government-citizen relations in the broadest sense. Convenient access to information, functionalities that enable online transactions, and vertical and horizontal integration of government which make it possible for citizens to interact with government are the criteria used in this study to assess these possibilities. Using this approach, the study sought to fill the gap in the research on e-government which has typically focused on taking an inventory of government online, but without relating them directly to information access and online services possibilities. The assumption of this study was that a better understanding of the functionality and information variables that allow greater government-citizen interaction outcomes is important for assessing e-government (using Stages as an indicator).

The integration of models and theories in studies of this nature about developing country settings are generally lacking (Chen et al., 2006; Yildiz, 2007), as are theoretical frameworks for e-government, which is a relatively new field of inquiry. Modernization, technological determinism and social constructivism are the theoretical frameworks used in the study. An exploration of the variables that explain the adoption and implementation of e-government in developing countries through a website content analysis was done using these theoretical frameworks. Other important variable which could impact on the development of e-government are acknowledged in the broader discussion in the course of the review of literature and e-government studies.

Previous studies have typically examined e-government from the perspective of experience in developed countries where information systems are substantially more advanced than in developing countries. However, the findings here indicate that e-

government development is contingent upon the information environments, policy and resource considerations that are country-specific. These could significantly impact commitment to pursuing predicted e-government patterns. The study thus sought to depart from the approach taken by other studies. To do so, it considered the predicted pattern in terms of developing country factors, such as information environments, technological resources, and government attention to the implications of a transformed information policy environment.

While there is an increase in the number of case studies of e-government, little systematic evidence has been gathered to evaluate the development of e-government in developing ministries. As a result, very little is known about the evolution over time of the content and function of government websites in developing ministries. As these ministries have faced critical challenges in government performance and development, analyzing the transformational potential of information technologies and, e-government in particular is a necessary step for strategically applying information and communication for policy development.

Because the use of new technologies to reinvent government appears as an attractive option for improving public sector performance, this study contributes to the examination the transformational potential of information technologies in developing ministries. It examines the development of e-government by using the indicators of official websites information provision (about ministries and their policies), interactive communication between public officials and citizens, and citizen action in relations with ministries. The study of e-government is an attempt to explain government-citizen

communication within the context of the multiple intersections of media and communication technologies, computer and information sciences, and public administration research.

The use of the Stages model as the framework for this study is aimed at assessing what governments in developing countries are doing with e-government. It assesses the complex problem of transformation has no universal approach exists. The description of Stages in the evolution of e-government, as described by a number of authors (e.g. Layne and Lee, 2001; Moon, 2002; Rao, Metts, & Monge, 2003 Ghasemzadeh and Sahafi, 2003; Janssen and Van Veenstra, 2005), represents discrete (and presumably discontinuous) phases that reflect the priorities and commitment of governments to transform by using information and communication technologies. Most stage models, however, have emerged from observations of daily practice, or they often use some kind of classification methodology.

Generally speaking, the stage models described in the literature have not been tested for applicability in practice, especially for e-government experience in developing countries. One commonly referred to is the model suggested by Layne and Lee (2001). This model identifies four growth stages: the Cataloguing Stage, the Transactions Stage, the Vertical Integration Stage, and the Horizontal Integration Stage. The Stages are explained in terms of the various levels of integration and sophistication involved. The model suggested by Layne and Lee, some suggest, reinforces the technological bias of organizations that promote e-government (Andersen and Henriksen, 2006).

The study took an empirical approach to examine the guidance that Stage Models provide. As already observed, many of these models, including the Layne and Lee Stages Model, though lacking a clear theoretical foundation for the identification of Stages, are still good analytical frameworks for the evaluation of e-government development. As described in the Layne and Lee model, a framework is needed for examining the status of a phenomenon, mapping its features and developing a systematic understanding of its trends and dimensions. One cannot study the contribution of e-government without a means of systematically describing the content on government websites and across time.

This single case study explored the development of e-government in less developed countries using the Kenyan government as a case study. The theoretical framework proposed that e-government can be linked to modernizing and producing positive changes in a government's communication capabilities. These would produce greater access to information and services for citizens and consequently provide a better relationship between citizens and governments.

The literature implied that the adoption of information technologies in developing countries lead to significant transformation in information access for citizens and in the delivery of services. According to the results from the content analysis for the 46 government ministries in this study, content and services development are indicators of trends in this transformation. While scores varied between ministries in terms of the Catalogue Stage, the Transactions Stage, the Horizontal Integration Stage and the Vertical Integration Stage, the conclusion from the content data is that considerable strides have been made in developing information content, increasing transaction

capabilities. Also, space for integrating government information and services vertically and horizontally has been increased as has the capacity for providing citizens with a usable interface for convenient interactions with government.

5.3: Summary of the Study

This study is the result of an empirical examination of the adoption, development, and status of electronic government in a developing country. A content analysis was conducted on Kenyan government ministries' websites to provide data on the current level of information and type of services functionalities available. A selection of content criteria was combined to represent variables identified in the Layne and Lee Stages model (2001) used in this study. The objective here was to develop an understanding of the status of e-government by using content analysis data gathered from the content and attributes of government ministry websites as empirical evidence. Through this analysis, the study assessed the possible contribution e-government can make in increasing access to information, improving the delivery of government services and enhancing government-citizen relations.

This study covered the websites established by 46 ministries that make up Kenya's central government, and used a quantitative content analysis research design to examine the website content variables that represent the functionality of the websites for information, communication, interaction, and integration of government services. Data were obtained using content analysis coding criteria derived from the CyPRG codebook. Content coding criteria were selected and adapted as instruments to measure e-government growth Stages variables.

Although the study was mainly quantitative in nature, a number of exploratory observations regarding e-government are drawn into the discussion, and they inform the study, aid conceptual understanding of e-government in the context of developing country experiences, and assist in the clarification of the results of the study.

In the next section the main conclusions for each of the hypotheses of the study are reviewed. In addition, implications for further research are discussed.

5.4: Summary of Research Findings

The broad research question in the study returned an expected result- that government ministries have adopted online communication as one of the main resources for delivery of services. The overall finding is that all ministries have some volume of information, some level of communication and interaction online, and some form of e-government has taken root as a tool of communication. The research questions each returned both positive and curious results. While it was expected that ministries' websites would have distinctly varied scores corresponding with their Stages of growth, the results showed that most have scores that lack an explanatory pattern across the stages. Ministries in the development functions category appeared to have more sophisticated websites, in terms of information and communication functionalities than did ministries in the administrative and regulatory category, and those in the services category. On the other hand, the dataset revealed the Layne and Lee Stages model prediction that e-government tended to grow progressively from the information (catalogue) stage towards the later stages. The study showed higher scores at the catalogue stage for all ministries than at all the other stages.

5.5: Review of the Main Conclusions of the Study

Two main research questions and two corresponding hypotheses were formulated for this study. For both hypotheses the predicted measures were: a presence of information content, features enabling citizens to interact with officials and carry out transactions, and online integration of government services horizontally and vertically. These four attributes of the ministry website are considered to represent the respective Stages of e-government.

Two approaches were used to analyze ministries' scores using the Stages framework. The first approach involved the grouping of ministries into categories representing similarities of functions: administrative and regulatory ministries, services based ministries, and, development ministries. Average scores for these categories across the four Stages of e-government were compared to determine whether differences in e-government performance were influenced by functions performed by ministries. The second approach acknowledged the different performance of ministries that could be explained by different factors but which led to varied content qualities of their websites as reflected in the scores for each stage. Details on how each of these content differences were operationalized and measured can be found in Chapter 3. The analysis of the two levels of the study led to the results reviewed below.

5.5.1: Hypothesis 1: Ministries' Functions Based Performance

Hypothesis 1 stated that there are no statistically significant differences between functional categories of ministries across progressive Stages predicted by the Layne and Lee model of e-government development. Accordingly, this hypothesis predicted that functions of ministries do not influence the content and functionalities found on ministry

websites. As reported in Chapter IV, the score counts related to the Stages of the website development confirm that the Catalogue Stage had significantly higher scores than the Transactions Stage, Vertical Integration Stage, and Horizontal Integration Stage for all three of the functional categories. This means that for all three of the functional categories, the Catalogue Stage is significantly better developed than the successive three other stages. However, statistical results show that there are significant differences between the functional groups of ministries from the results for the Transactions and Horizontal Integration Stages. This finding suggests that, as e-government development continues, scores for some Stages might be significantly different depending on types of services and functions performed by different ministries.

The first hypothesis was supported because ministries in the development category had higher scores, compared to ministries in the administrative and services categories, at all the four Stages of e-government – the Catalogue Stage, the Transactions Stage, the Vertical Integration Stage, and the Horizontal Integration Stage. This finding may have a bearing on possible resource differences, and varying levels of receptiveness (between ministries) to technological innovation. These may be important predictors of ministries' readiness to implement more innovations and applications on their websites. Ministries in the development category, because of possible larger budget allocations, better trained personnel and functions that require innovation might have better developed websites. Ministries in the administrative and regulatory category, on the other hand, appear slower at adopting sophisticated online solutions for such reasons as policy stringencies about change. Ministries in the services category would typically be

expected to be interested in innovations that create technological solutions that make their services more convenient and accessible. In spite of this assumption, scores for this category were also comparatively lower.

5.5.2: Hypothesis 2: Ministries' Score Differences by Stages

Hypothesis 2 stated that, based on the pattern predicted by the Layne and Lee Stages model, there will be higher scores for earlier Stages of e-government than there will be for later stages. The results of the analysis indicate that there is a significant difference in the median scores in the comparison of the ministries across the four stages. Posthoc tests showed that there is a statistically significant difference between the Catalogue Stage and the Transactions Stage (0.000), the Catalogue Stage and the Vertical Integration Stage (0.000), the Transactions Stage and the Horizontal Integration Stage, and, Vertical Integration Stage and Horizontal Integration Stage.

Overall, there is a statistically significant difference between the functional categories of ministries at some Stages of e-government. This is coupled with the pattern of higher to lower scores from the Catalogue Stage to the other Stages, and it confirms the model prediction that e-government development starts with basic static information before progressing to more complex functionalities such as transactions and integration. According to the statistics, the Catalogue stage has overall higher scores than all the other Stages confirming the model prediction that earlier Stages of e-government development have higher scores than later stages.

5.6: Discussion

None of the studies on e-government that were identified in the context of this work examined the possible impact of ministries functions to the content of their websites

or their willingness to implement e-government according to predicted progression patterns. The strong and consistent link between functions and website content that was identified in the course of this study suggests that future research should certainly take into account this variable.

Furthermore, it should be noted that this study examined website content of websites only in terms of Stages of e-government development. It is assumed that ministry functions not only impacts content quality, volume and functionality types, but that it also impacts the extent to which ministries are willing to share information or not. Thus, in addition to testing function as a predictor variable, it is important that future research considers the possible relationship between function type and the attributes that are found on ministry websites.

A final point with regard to function is that evidence suggests that ministries may, by virtue of their different functions, not only be less inclined to share information with citizens, or to enable them to participate in interactive communication, or to transact business online, but may also by nature of their functions, find face to face service systems more practically appropriate.

This hypothesis was fully supported for the link between ministry functions and scores associated with different Stages of e-government development.

Partial support was found for the link between the progression of e-government in terms of score levels and the different Stages of development. Comparatively higher scores at the catalogue stage confirmed the model prediction that e-government

progresses from the provision of basic catalogue information towards more sophisticated stages.

5.7: Interpretation of the Results

The study contributes to the literature and practice in a number of ways. First, it helps describe and outline how to define and assess key attributes of e-government activities which can be used in a Stages model framework study. It can help governments to enhance the awareness and understanding of Stages of e-government. Second, this research expands the scope of current studies on the Stages model by providing an in-depth content analysis focusing on developing country ministries' websites. For policy makers and practitioners, assessing the content of websites based on a selection of criteria representing information and services enables them to determine how to prioritize strategies and resources. For academics, this study sheds light on some conceptual and methodological approaches to the study of e-government in developing countries where information and other resource deficiencies mean the effectiveness of e-government cannot be taken for granted. Third, applying the Stages model will be helpful for conducting an objective assessment in countries at early Stages of e-government adoption and implementation. On the basis of a Stages model, governments can conduct self-assessments and establish stable and consistent implementation processes.

The current study provided a single set of results in what needs to be a continuum of research. The government and ministries in this study, as the case study for developing countries e-government, are not necessarily representative of all developing countries' government since experience is varied depending on various different factors. We cannot

accurately generalize from this single case study to all e-government cases in developing countries. This invites more variations of this study focused on content and web attributes, specific in-depth study of each of the stages, regional variations, information policies, and regulations.

The current study demonstrated that e-government, as a transformational information revolution, should be studied empirically and theoretically, so as to develop a body of research for understanding the role of communication technologies and communication in developing countries. This study also demonstrates that while governments in developing countries are making efforts to implement e-government, experience tends to reveal different shortcomings in information policies and functions that impede conventional growth expectations.

5.8: Conclusions

In this chapter, we summarized the results of the study, discussed how the results can be applied to developing countries e-government experiences and opened the question of whether modernization, technological determinism and social constructivist theories can be used to develop frameworks for examining the unique experience of developing countries that adopt e-government. This study sought to answer whether the Layne and Lee model framework is a useful research tool for this type of study, and to some extent, we found it a useful, yet not exhaustive, framework. It also raised an important question about whether functions of ministries can be a determining factor for the way each ministry's website develops along the Stages continuum.

The practical purpose of this study was to provide empirical evidence about the status of e-government in developing countries, and the usefulness of the Stages models as a framework for research on experiences in developing countries. The lessons learned from this study can inform further studies of e-government development experiences within developing countries. The results of this study have shown that e-government Stages of growth reveal the promise of fully developed online services. The study has also demonstrated that there may be other underlying factors that explain how developing countries adopt and use the norms and practices of e-government.

Another goal of this research was to extend the Stages model construct developed by Layne and Lee (2001), using content analysis to explore e-government in a developing country, referencing the theoretical frameworks in the literature that focus on communication in developing countries, such as modernization, technological determinism and social constructivism. The study also aimed to examine trends in the adoption of e-government in developing countries, and to empirically assess the Stages of e-government development in a case study of Kenyan government ministries. The results of the analysis suggest that each goal was met with some measure of success. Developing country governments can use these results not only to measure their progress at implementing e-government but also to compare their success rate with that of other countries, and also as a way to prescriptively achieve a desired level of e-government by focusing on developing functionalities which aim at improving available information and creating effective online interfaces with citizens.

The results of the analysis illustrate the usefulness of the Layne and Lee Stages model as a framework for the study of e-government. While some hypotheses were not fully supported, the main hypotheses, such as the relationship between ministry functions and their performance in terms of developing web content, were in fact supported. Additionally, the predicted trends in e-government development that were significant but contrary to the hypothesized direction included the presence of content indicators in each of the Stages with score levels not predicted by the Stages model. Each stage of e-government development was predicted to have a higher level of scores through successive progression levels. This would confirm that the Layne and Lee Stages model of e-government accurately predicts that government websites are consistently moving towards more sophistication and, hence, total transformation to provide communication, information and services most effectively.

The logic behind these hypotheses was that the effectiveness of electronic government depends upon the deliberate and predictable growth by Stages towards the transformation of government services, through the gradual evolution of online services which are assumed to be more convenient and more effective. However, the dataset and this study do not conclusively reveal this purposeful action by the government. This dataset suggests that perhaps ministries in fact do put forth sustained effort at improving their websites, and changing from contact- based to online-based interaction with and services for citizens. This could be the result of the conventional practices and encouragement by nations that have embraced advanced communication technologies. It

could also be the result of policy prescriptions by international development partners. Additional study would be required to ferret out the underlying reasons for this finding.

Another possible explanation could be that government is simply willing to throw money at e-government projects and hope to catch up with a trendy innovation, unlike their advanced counterparts that have information cultures that have encouraged more methodical needs-driven approach to e-government.

Although there is agreement that a country's e-Government efforts progresses along an information-communication-transaction-transformation continuum, the capability to deliver information and services to citizens effectively may not easily be attained by developing countries. The expectation of widespread use of online access to information, citizen participation in government matters and an increase in transparency by citizens may remain elusive as developing countries face challenges that impede such progress.

The environment for the optimal utilization of information technologies and e-government in particular, is not a function of technological infrastructure capacity alone. To a large extent various factors and challenges determine the effective utilization of technology. These are social and political factors that have to be considered in the system design to create an enabling environment. Among the factors that must be addressed to effectively reap the benefits of information technologies is the enactment of appropriate government information legislation and policies as well as appropriate administrative reform. The bureaucratic culture and systems in developing countries pose endemic problems that challenge to new information systems. In particular, information systems

that build on existing legislative and policy arrangements may exacerbate inefficiencies from traditional administrative methods rather than improve services.

The contribution that e-Government can make as a resources for transformation is affected by the absence of concrete measures to adapt information policies, laws and administrative practices necessary for access to and value of information as a resource.

Limited access to information technologies, the digital divide (difference between populations with access to information technologies and those without), has a direct effect on the widespread use of e-government. Developing countries with limited access to technology are likely to be slow in taking advantage of e-government.

E-Government requires a comprehensive strategy to guarantee the effective development of universal access to information. This means that for e-Government to be successful the right of access to information has to be guaranteed, an information development, storage and retrieval system has to be put in place and universal access to information has to be guaranteed. The policies of governments and the challenges of creating a digital literate society to be able to fully exploit digital technology also determine whether e-Government will be successfully implemented.

E-Government success also assumes that there will be a high internet penetration in a country and the necessary levels of knowledge and skills in a country. This assumption is not true of many developing countries where a majority of the population lives in rural areas and lack access to telecommunications and related infrastructure. Developing countries still lag behind in the knowledge and skills to incorporate these standards in

planning and implementing e-Government. This may lead to failure in terms of the transformation of government information processing and dissemination.

Underlying the idea of e-Government is the need to transform the way government functions. Without making necessary changes in work processes governments in developing countries may not deliver the e-Government advantages in information and service delivery.

Changes expected to occur as a result of e-Government implementation can be impeded by a government's unwillingness to channel resources towards e-Government implementation and the restructuring this will require. For the effective implementation and success of e-Government, strategies should include clear goals for information content, technology resources, processes in government, staffing and skills, changes in management systems and structures, and a reliable flow of resources. Governments that provide broadly for these factors are more likely to succeed in developing a transformed service delivery and information systems.

5.9: Implications

As the previous studies have indicated, before governments in developing countries can begin to address the implementation challenges facing them, they must have a commitment to e-government and a plan for pursuing it. In this regard, the starting point for many countries is a very shaky one. To begin with, we are discussing building e-government on a foundation of leaders' awareness of and commitment to the evolving role of information as a public sector management resource. Instead, measures to adopt information technologies and their application in public sectors have, for the

most part, been at the urging of international development partners. As a result, a degree of tokenism characterizes efforts to create the environment for e-government. For example, Kenya's e-government strategies do not include measures to promote citizen awareness of these new opportunities. At the same time, few legislative and policy provisions have been introduced to support citizens' right of access to information. Initial steps in e-government development are focused on creating the internal infrastructure capacity in government ministries with little attention to public access resources.

The second problem is that under prescriptive pressures from external agencies, many developing nations adopt for themselves the plans of advanced nations, rather than developing strategies and plans unique to their own situations. Historically, Kenya's policy makers, like in other developing nations, have taken the approach that modern communication systems could be introduced by making a few adaptations in the models offered by industrialized countries based on their established traditions of the paper press, broadcasting and other media. This approach resonates with the diffusion-modernization thesis of Lerner, Schramm and Rogers in the 1950s and early 1960s which conceived of development as the transfer of technology from the industrialized nations to the modernizing elite sector of the less industrialized countries and through these elites, to the disadvantaged lower status urban and rural groups. This approach considered communication's role as that of providing channels for transferring modernizing values to backward traditional sectors through the use of broadcasting hardware and the bureaucratic organization for transferring information and the mass media.

For example, Kenya's e-government and information strategy launched in 2004 is modeled after the E.U. plan. The EU has a major role in the coordination of ICT development plans in Africa. The second National ICT Policy (2006) is modelled from the African Information Society Initiative (AISI) prototype that was developed by the United Nations Economic Commission for Africa's (UNECA).

These plans reflect the experiences of developed nations and are built on assumptions relevant to those nations. The result is that implementation efforts can be as much cosmetic as real with objectives, strategies and measures that meet external funding prescriptions rather than domestic goals and realities.

Another factor is the under-developed legislative and policy environment for the role of information and information technologies in development. Information is an important resource in the management of public sector business. An information system is vital for the successful achievement of developmental goals. Effective e-government will only be realized in a sustainable information environment. Governments in developed countries recognize the importance of these issues and have placed them on the list of priorities in their legislation and policy agendas.

Comparisons of information systems and policies between developed and developing countries show important reasons for differences between e-government implantation outcomes. In developed countries, the dissemination of information, as well as efforts at creating access to government information, are secured under a set of policies that manage government information holdings and communications. Examples include the US and Canada where legislation and policies are in place to secure the rights

of access to information (Prophet, 1999). These are examples of advanced western nations' well-developed information systems which make these countries leaders in e-government worldwide (according to the UN e-Government Survey (UNDESA, 2008).

Governments in developing countries, on the other hand, have underdeveloped information legislation, communication systems, and information policies. These challenges make it difficult to plan and to utilize information and communication technologies effectively. In Kenya, for example, communication receives inadequate attention as a public policy issue, as observed by Mutero (1998) who cited the example of the country's five-year development plan that has a token mention of communication infrastructure. This minimalist approach to communications suggests its inadequate prioritization. Policy makers, political leaders and lawmakers are poorly equipped to deal meaningfully with communication questions, since these are inherently interdisciplinary, technically complex, and socially sensitive, according to Mutero (1998).

The availability of advanced information communication technologies creates new opportunities that can be best harnessed through appropriate enabling legislative, policy and institutional environment. Kenya has formulated strategies, written new policy proposals and legislation in an attempt to create the enabling environment for e-government. These measures place greater emphasis on creating the institutional capacity by installing infrastructure in government offices. There is little evidence in the e-government policy about measures towards citizen-centric information dissemination and content development policies.

5.10: Recommendations for Future Research

The issues described below are germane to e-government research but were out of scope for this study. However, these additional ideas could provide insights that will shed some light on the Stages model approach to the study of e-government in developing countries.

This study should be repeated and extended to confirm and further define the findings, not only for Kenya government ministries, but also for other developing countries and for the region also. Further research can be done using different countries' experiences, different stage-specific content studies (such as the Transactions Stage), between different ministries' implementation efforts and experience. Further studies should include challenges and resource limitations, and citizen experience survey studies to explore the impact of e-government among users.

Future repetitions of this study take into consideration the government's willingness (or otherwise) to implement policy changes that expand access to information by assessing current information policies, public readiness and demand for access to information. This information could be used to determine the potential impact of e-government policies to the study of Stages development, or to help evaluate the results on the basis of such extraneous factors.

The prior research that informed modernization and technological determinism theories led to assumptions of uncritical receptiveness of developing countries to western innovations. Social constructivist theories accepts the idea that user needs influence the applications of new technologies. Future research should look into ways that

governments in developing countries adapt e-government functionalities to the contexts and traditions of services provision and information systems.

An alternative approach is the functional analysis suggested in Wright's (1974) discussion about the impact of communication media use in society's institutions. This approach to the study of mass communication can aid the analysis of governments' adoption of information and communication technologies. This approach can be used to develop approaches that remedy the limitations of narrow frameworks which do not address broad research questions such as what functions can be attributed to communication and the media in society, and how these can be delineated and examined through research.

Research on e-government represents a search for answers for the introduction of a new medium of communication into a society that previously lacked such a system. Such studies mirror modernization studies carried out by Schramm and others (1961) when television was introduced into communities that did not have these kinds of media before. Functionalism is an alternative method that can be used in research on the effects of mass communication within other social institutions especially where advances in the means and conditions of mass communication have far reaching impacts on society as a whole.

Boczkowski and Lievrouw (2007) suggested the use of frameworks that characterize and facilitate the understanding of modes of communication and culture, especially those related to new media technologies that did not fit easily into either the interpersonal or mass media categories. These include communication models that

provide a means of analysis. It is important in studies of information and communication technologies (the study of e-government, in particular) to consider to what extent current models accommodate changes in communication technologies.

5:11 Limitations of the Study

As with all studies, this study is subject to limitations, and these can potentially influence conclusions drawn from the dataset. First, because this is a case study focusing on a single government's e-government implementation experience, the findings are not adequately representative of the experience in other developing countries. In addition, the data is only drawn from the website content, limiting causal inferences regarding the effects of measured variables. For example, rather than concluding that government has attained the transformation to effective service delivery systems, it might only be possible to conclude that higher scores at progressively higher Stages of e-government are indicators of enhanced levels of services delivery and access to information.

Conceptually, e-government, as broadly defined, embodies the use of information and communication technology in public administrations, combined with organizational change and the acquisition of new skills in order to improve public services and strengthen support to public policies. This process involves the effective interaction of actors and users in an environment enabled by information technologies. In this respect, a study of the effective implementation of e-government is limited to the extent that it does not cover the various dimensions and variables involved.

This study, a study of website content, is limited in this sense. Overcoming this limitation in future studies requires methodological and conceptual remedies, such as a better examination and explanation of the processes of, and participation patterns in, e-government projects within complex political environments. It would also address conceptual limitations in the e-government literature by producing more grounded and empirical studies that create new theoretical directions and provide new concepts and categories so as to enhance our understanding of e-government policy processes and actors.

References

Abanumy A, Al-Badi A, and Mayhew P (2005) "e-Government Website Accessibility: in-Depth Evaluation of Saudi Arabia and Oman" *The Electronic Journal of e-Government* Volume 3 Issue 3 pp 99-106, available online at www.ejeg.com

Andersen, K.V. and Henriksen, H.Z. (2006) E-government maturity models: Extension of the Layne and Lee model, *Government Information Quarterly* Vol.23 Issue 2 (2006), pp. 236-248.

Basu, S., (2004), E-Government and Developing Countries: An Overview. *International Review of Law, Computers and Technology*, Vol. 18, No. 1, pp. 109-132 March 2004.

Belanger, F. and Hiller, J. S. (2006), A framework for e-government: privacy implications. Business *Process Management Journal*, Vol. 12 No. 1, pp. 48-60.

Berelson, B. (1952), *Content Analysis in Communication Research*, Glencoe, IL: Free Press

Boczkowski, P. and Lievrouw, L. (2007) Bridging STS and Communication Studies: Scholarship on Media and Information Technologies. The Handbook of Science and Technology Studies. The MIT Press. Cambridge, Massachusetts. London, England

Carter, L. and Belanger, F. (2004), The Utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal*, Jan 2005, Vol. 15 Issue 1, p5-25, 21p

Chadwick, A. and May, R. (2003), Interaction between States and Citizens in the Age of

the Internet: e-Government in the United States, Britain, and the European Union. *Governance: An International Journal of Policy, Administration, and Institutions*, Vol. 16, No. 2, April 2003, pp. 271-300

Coursey, D. and Norris, D.F. (2008), Models of E-Government: Are They Correct? An Empirical Assessment, *Public Administration Review* Vol. 68 Issue 3, pp.523-536, 14p May | June 2008

Chadwick, A. and May, R. (2003), Interaction between States and Citizens in the Age of the Internet: e-Government in the United States, Britain, and the European Union. *Governance: An International Journal of Policy, Administration, and Institutions*, Vol. 16, No. 2, April 2003, pp. 271-300

Chandler, D. (1995): 'Technological or Media Determinism' (WWW document) URL http://www.aber.ac.uk/media/Documents/tecdet/tecdet.html (*visited in August 2008*)

Chen, Y.N.; Chen, H.M.; and Huang, W. (2006) E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study *Journal of Global Information Management*, 14(1), 23-46, January-March 2006

Coursey, D. and Norris, D. F. (2008) Models of e-Government: Are they Correct? An Empirical Assessment *Public Administration Review*; May 2008, Vol. 68 Issue 3, p523-536

Chen, Y. N.; Chen, H. M.; Huang, W.; Ching, R. K. H**.** (2006) E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study Journal of Global Information Management, Vol. 14, Issue 1, 2006 pp. 23-46

Chen, Y. N. Chen, H. M., W. Huang, Ching, R. K. H.(2006) E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study *Journal of Global Information Management*, 14(1), 23-46, January-March 2006

Choudrie, J. and Gheorghita, G. (2005): Integrated views of e-government website usability: perspectives from users and web diagnostic tools. *Electronic Government, an International Journal* 2005 - Vol. 2, No.3 pp. 318 - 333

Cook, M.E. (2000) What Citizens want from e-government: Current Practice research. New York: Center for Technology in Government University at Albany, SUNY.

Cook, M.E. (et. al.), (2002) Making the Case for Local e-Government. State University of New York at Albany. Center for Technology in Government

Coursey, D. and Norris, D.F. (2008), Models of E-Government: Are They Correct? An Empirical Assessment, *Public Administration Review* Vol. 68 Issue 3, pp.523-536, 14p May /June 2008

Dada, D. (2006). The Failure of E-Government in Developing Countries: A Literature Review. *The Electronic Journal of Information Systems in Developing Countries*, Vol 26 (2006)

Demchak, C., Friis, C. and La Porte, T.M. (2000), Webbing Governance: National Differences in Constructing the Face of Public Organizations. In Garson, G. D. ed., *Handbook of Public Information Systems*, (New York: Marcel Dekker Publishers, 2000).

Demchak, Chris C.; Friis, C., & La Porte, T.M. (1998), Reflections on Configuring

Public Agencies in Cyberspace: a Conceptual Investigation. In Snellen, I. Th. M. and van de Donk, W. B. H. J.(eds.), *Public Administration in an Information Age: A Handbook*, (Amsterdam: IOS Press, 1998), pp. 225-244.

Dong, Y. K., Grant, G. (2010) "E-government maturity model using the capability maturity model integration", *Journal of Systems and Information Technology*, Vol. 12 Iss: 3, pp.230 - 244

Fairchild A.M. and Quansah, E.A. (2007), Approaching the digital divide in Sub-Saharan Africa: technological determinism and social constructionism? In *International Journal of Knowledge and Learning*, Vol. 3, No. 6, 2007.

Esteves, J. and Joseph, R. C., (2008) A comprehensive framework for the assessment of e-Government projects *Government Information Quarterly* 25 (2008) 118–132

Fang, Z. (2002) E-Government in Digital Era: Concept, Practice, and Development *International Journal of the Computer, the Internet and Management*, Vol. 10, No.2, 2002, p 1-22

Field, Andy (2009, Third Edition), Discovering Statistics using SPSS, 2009

Ghasemzadeh, F. & Sahafi, L. (2003) "E-Commerce Adoption: A Two Dimensional Maturity Model" 4th World Congress on the Management of Electronic Business, McMaster University, Hamilton, On., Canada, January 15-17

Gil-Garcıa, J. R. and Pardo T. A., (2005), E-government success factors: Mapping practical tools to theoretical foundations *Government Information Quarterly* 22 (2005) 187–216

Gil-Garcia, J. R. and Martinez-Moyano, I. J. (2007) Understanding the evolution of e-

Government-The influence of systems of rules on public sector dynamics *Government Information Quarterly* Vol. 24, Issue 2, April 2007, Pages 266-290

Goldberg, Jeffrey S., (2009) "State of Texas Municipal Web Sites: A Description of Website Attributes and Features of Municipalities with Populations between 50,000 and 125,000" (2009) *Applied Research Projects, Texas State University-San Marcos.* Paper 307 http://ecommons.txstate.edu/arp/307

Griffin, D., Foster, A., and Halpin, E. (2004), Joined-up e-Government: an exploratory study of UK local government progress *Journal of Information Science and Technology* JIST 1(2) 2004 www.jist.info

Heeks, R. (2002) Information Systems and Developing Countries: Failure, Success, and Local Improvisations, *The Information Society*, 18:101–112, 2002

Heeks, R. and Bailur, S., (2007), Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice *Government Information Quarterly*, Vol. 24, pp. 243-265.

Holderness, M. (1998) Who are the world's information poor? In B.D. Loader (ed.), Cyberspace divide: Equity, agency and policy in the information age (pp. 35-56). London & New York: Routledge.

Holliday, I. (2002). Building e-government in East and Southeast Asia: Regional rhetoric and national (in) action. *Public Administration and Development*, Vol. 22, pp. 323-335.

Holsti (1969) *Content analysis for the social sciences and humanities.* Reading, MA: Addison-Wesley.

Holzer, M. and Melitski, J. (2003), A Comparative E-Government Analysis of New Jersey's 10 Largest Municipalities, National Center for Public Productivity Graduate Department of Public Administration Rutgers University—Campus at Newark, http://www.cornwall.rutgers.edu/

Howcroft, D. (1999) The Hyperbolic Age of Information: An Empirical Study of Internet Usage *Information, Communication & Society*, Volume 2, No. 3 September 1999, pp. 277 - 299
http://www.mitpressjournals.org/doi/pdfplus/10.1162/itid.2007.3.4.1

Ibrahim A, Yazici, A.; Mishra, A.; and Arifoglu, A (2005), E-Government: A global view and an empirical evaluation of some attributes of citizens *Government Information Quarterly*, Volume 22, Issue 2, 2005, Pages 239-257

Ifinedo, P. (2005). Measuring Africa's E-readiness in the Global Networked Economy: A Nine-Country Data Analysis *The International Journal of Education and Development using Information and Communication Technology (IJEDICT)* 1, 1, pp. 53-71 [ISSN: 1814-0556]

Information Society Commission (2003), eGovernment: More Than an Automation of Government Services, www.isc.ie/downloads/egovernment.pdf

Jae Moon M. (2002), The Evolution of E-Government among Municipalities: Rhetoric or Reality? *Public Administration Review*, Volume 62, Issue 4, pages 424–433, July/August 2002

Janssen, M. and van Veenstra, A. F., (2005). Stages of growth in e-Government: an architectural approach *The Electronic Journal of e-Government*, Vol. 3, No. 4, pp 192-200.

Kaaya, J. (2003) Implementing e-Government Services in East Africa: Assessing Status through Content Analysis of Government Websites, *Electronic Journal of e-Government* Volume 2 Issue 1 (39-54)

Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. Beverly Hills, CA: Sage.

La Porte, T. M., Demchak, C. C., & Friis, C., (2001), Webbing Governance: Global Trends across National Level Public Agencies, *Communications of the ACM*, January, 2001

La Porte, T. M., Demchak, C.C., de Jong, M. & Friis, C. (2000), Democracy and Bureaucracy in the Age of the Web: Empirical Findings and Theoretical Speculations. Presented at the International Political Science Association Québec, Canada, August 5, 2000

La Porte, Todd, M., de Jong, M. & Demchak, C.C., (2004), Public Organizations on the World Wide Web: Empirical Correlates of Administrative Openness

La Porte, T.M., de Jong, M., and Demchak, C. C., (1999), Public Organizations on the World Wide Web: Empirical Correlates of Administrative Openness. Presented at the National Public Management Research Conference Program, Bush School of Government and Public Service, Texas A & M University December 3, 1999

La Porte, T.M., Demchak, C.C., and de Jong, M. (2002). Democracy and Bureacucracy in the Age of the Web: Empirical Findings and Theoretical Speculations. *Administration and Society*, 34, pp. 411-446.

Layne, K., and Lee, K. (2001), developing fully functional E-government: a four stage model. *Government Information Quarterly*, Vol. 18, pp. 122-136.

Lee, J. and Kim, J. (2007), Grounded theory analysis of e-government initiatives: Exploring perceptions of government authorities *Government Information Quarterly,* Vol. 24 No. 1, p135-147, 13p

Leith, P. and Morison, J. (2004) Communication and Dialogue: What Government Websites Might Tell Us about Citizenship and Governance *International Review of Law Computers & Technology,* Volume 18, No. 1, Pages 25–35, March 2004

Lerner, D. (1958). The Passing of traditional society. Glencoe, Ill.: Free Press.

Layne, K. and Lee, J. (2001) Developing Fully Functional e- Government: A Four Stage Model, *Government Information Quarterly* Vol.18 Issue 2 (2001), pp. 122-136.

Layne, K. and Lee, J. (2001), Developing fully functional E-government: A four stage Model, *Government Information Quarterly* 18 (2001) 122–136

Melitski, J. (2003). Capacity and e-government performance: An analysis based on early adopters of Internet technologies in New Jersey. *Public Performance and Management Review, 26*(4), 376-390.

Melitski, J. and Holzer, (2007), Assessing Digital Government at the Local Level Worldwide: An Analysis of Municipal Web Sites throughout the World http://old.igi-global.com/downloads/excerpts/1599042851ch1.pdf

Meso, P., Datta, P., and Mbarika, V. (2006), Moderating Information and Communication Technologies' Influences on Socioeconomic Development with Good Governance: A Study of the Developing Countries. *Journal of the American Society for Information Science and Technology,* Vol. 57, No.2, pp.186 - 197

Netchaeva, I. (2002). E-government and e-democracy: A comparison in the North and South. *Gazzette: The International Journal for Communication Studies,* Vol. 64, pp. 467-477.

Norris, P. (2000), The Worldwide Digital Divide: Information Poverty, the Internet and Development, Paper for the Annual Meeting of the Political Studies Association of the UK, London School of Economics and Political Science, 10-13th April 2000. Roundtable on *The Future Role of New Media in Elections* Wednesday 12th April 10.45-12.15.

Park, R. (2007), Measuring Factors that influence the success of e-government initiatives. Nova Scotia University.

Pina, V., Torres, L. and Royo, S. (2007) Are ICTs Improving Transparency and Accountability in the EU regional and Local Governments? An Empirical Study. *Public Administration,* Vol. 85. No. 2, pp. 449-472.

Pye, Lucian W. (1970) Communications and Political Development.

Potnis, D.D. (2009), Measuring e-Governance as an innovation in the public sector *Government Information Quarterly* 27 (2010) 41–48

Raiti, G. C. (2007). "The Lost Sheep of ICT4D Research". in *Information Technologies and International Development, Summer 2006, 3*(4), 1-7. Cambridge: MIT Press.

Rao, S. S., Meets, G., & Mora-Monge, C. A. (2003). Electronic commerce development in small and medium sized enterprises: A stage model and its implications. *Business Process Management Journal,* 9(1), 11-32.

Reddick, C. G. (2004) A two-stage model of e-government growth: Theories and

empirical evidence for U.S. cities, *Government Information Quarterly*, Volume 21, Issue 1, 2004, Pages 51-64

Reece, B., (2006). E-Government Literature Review. *Journal of E-Government*, Vol. 3 (1). 2006.

Roman, P. (2005), The Place of Development Communication: Retrospect and Prospects, *Communication Yearbook* 29, pp.311-331.

Santos, R. and Heeks, R. (2003): *ICTs and Intra-Governmental Structures at Local, Regional and Central Levels: Updating Conventional Ideas.* IDPM, University of Manchester, UK

Scholl, H. J. (2006) Electronic government: Information management capacity, organizational capabilities, and the sourcing mix. *Government Information Quarterly* 23 (2006) 73–96

Schramm, W. (1964). Mass media and national development. Stanford, CA: Stanford University Press.

Schramm, W., Lyle, J., and Parker, E. B. (1961), Television in the Lives of Our Children, (Stanford, CA: Stanford University Press).

Siau, K. and Long, Y., (2005), Synthesizing e-government stage models- a meta-synthesis based on meta-ethnography approach. *Industrial Management and Data Systems*, Vol. 105, No. 4, 2005 pp. 443-458.

Silcock, R. (2001). What is e-government? *Parliamentary Affairs*, Vol. 54, pp. 88-101.

Tat-Kei Ho, A. (2002), Reinventing Local Governments and the E-Government Initiative *Public Administration Review* Volume 62 No. 4, Pages 434 – 444

Tolbert, C.J. & Mossberger, K. (2006). The Effects of E-Government on Trust and Confidence in Government *Public Administration Review*, Vol. 66 No. 3, pp. 354-369

Torres, L. Pina, V. and Acerete, B. (2005) E-government developments on delivering public services among EU cities *Government Information Quarterly* 22 (2005) 217–238

UN Economic and Social Council (2003), Enhancing the capacity of public administration to implement the United Nations Millennium Declaration: Status of and trends in the development of e-government

UNDESA (2008), United Nations e-Government Survey 2008: From e-Government to Connected Governance

Wright, C. R. (1974) Functional Analysis and Mass Communication Revisited, Reprinted from The Uses of Mass Communications, edited by Jay G. Blumler and Elihu Katz (Beverly Hills: SAGE Publications, Inc., 1974), pages 197-212. http://repository.upenn.edu/asc papers/86

Yildiz, M. (2007) E-government research: Reviewing the literature, limitations, and ways forward, *Government Information Quarterly*, Volume 24, Issue 3, July 2007, Pages 646-665

Zhiyuan, F (2002) E-Government in Digital Era: Concept, Practice, and Development *International Journal of the Computer, the Internet and Management, Vol. 10, No.2, 2002, p 1-22*

Appendices

Appendix 1: Content Coding Tables

Table 1: Indicators of Web Presence Fulfilling Criteria for Stages of e-Government

Catalogue	Transaction	Vertical Integration	Horizontal Integration
T3a: Provides a senior official's vision of the future of the agency	**T2a:** Provides ministry's contact information e.g. non-email addresses	**I3a:** Provides link to listed sub-elements within agency	**T4a:** Provides other issue-related addresses for other government agencies
T3b: Provides an agency's mission statement	**T2b:** Provides phone numbers for employees beyond senior officials	**I3b:** Provides link to sublevels noted in agency's organizational structure graphic	**T4b:** Provides non-issue-related addresses for other government agencies
T3c: Provides organizational structure in graphic form e.g. org. chart	**T5a:** Explains requirements of agency for citizens	**I4a:** Provides link to outside issue-related government addresses	**I4a:** Provides link to outside issue-related government addresses
T4a: Provides other issue-related addresses for other government agencies	**T5b:** Instructs citizens how to perform actions	**I4b:** Provides link to outside non-issue-related government addresses	**I4b:** Provides link to outside non-issue-related government addresses
T4b: Provides non-issue-related addresses for other government agencies	**T5c:** Instructs citizens about action and appeals procedures	**I4c:** Provides link to issue-related outside non-governmental information sources	**I4c:** Provides link to issue-related outside non-governmental information sources
T4c: Provides issue-related addresses for non-governmental information sources	**I2b:** Provides email clickable link to senior officials	**I5d:** Provides link to appeals process	
T4d: Provides laws, research publications, regulations and reports in easily readable form	**I2c:** Provides email clickable link to senior employees	**T5c:** Instructs citizens about action and appeals procedures	
T4e: Provides searchable index for archived newsletters, laws, regulations and reports	**I2e:** Provides an online issue-related forum for outsider participation such as chat lines, and listserves.		
T4f: Provides all downloaded or printed publications for free	**I3c:** Provides automatic update announcements or newsletters via subscription		
T4g: Provides link to or text of public information, law or regulation	**I4a:** Provides link to outside issue-related government addresses		
	I4b: Provides link to outside non-issue-related government addresses		
	I5a: Provides any required submission forms onscreen for download		
	I5b: Provides for online form completion and submission		
10 items standardized to 100 point scale	13-items standardized to 100 point scale	7-items standardized to 100 point scale	5-items standardized to 100 point scale

Table 2: Content Analysis Coding Items for Stages Variables

Stage	Coding Items Included
Catalogue	**T3a -** official's vision of the future of the agency **T3b -** agency's mission statement **T3c -** organizational structure in graphic form e.g. org. chart **T4a -** other issue-related addresses for other government agencies **T4b -** Provides non-issue-related addresses for other government agencies **T4c -** Provides issue-related addresses for non-governmental information sources **T4d -** Provides laws, research publications, regulations and reports in easily readable form **T4e -** Provides searchable index for archived newsletters, laws, regulations and reports **T4f -** Provides all downloaded or printed publications for free **T4g -** Provides link to or text of public information, law or regulation
Transactions	**T2a -** Provides ministry's contact information e.g. non-email addresses **T2b -** Provides phone numbers for employees beyond senior officials **T5a -** Provides any required submission forms onscreen for download **T5b -** Provides for online form completion and submission **T5c -** Provides automatic reply notifying expected time of response from the agency **I2b -** Provides email clickable link to senior officials **I2c -** Provides email clickable link to senior employees **I2e -** Provides an online issue-related forum for outsider participation such as chat lines, and listservs. **I3c -** Provides automatic update announcements or newsletters via subscription **I4a -** Provides link to outside issue-related government addresses **I4b -** Provides link to outside non-issue-related government addresses **I5a -** Provides any required submission forms onscreen for download **I5b -** Provides for online form completion and submission
Vertical Integration	**I3a -** provides link to listed sub-elements within agency **I3b -** provides link to sublevels noted in agency's organizational structure graphic **I4a -** provides link to outside issue-related government addresses **I4b -** provides link to outside non-issue-related government addresses **I4c -** provides link to outside issue-related non-governmental information sources **I5d -** provides link to appeal process for decisions and/or an ombudsman **T5c -** provides other language access to site for visitors unable to speak or read the language of the host country
Horizontal Integration	**T4a -** Provides other issue-related addresses for other government agencies **T4b -** Provides non-issue-related addresses for other government agencies **I4a -** Provides link to outside issue-related government addresses **I4b -** Provides link to outside non-issue-related government addresses **I4c -** provides link to outside issue-related non-governmental information sources

Table 3: Content Analysis Codebook: Coding Criteria

Transparency		
Ownership		
T1a: agency involvement with site	Tests if agency helped in making of website and how different it is from websites of other agencies in same government.	Marked by 0 or 1.
T1b: webmaster appears to be different from the one running the main government page, if one exists	Tests if agency, or sub-agency, has some measure of control or direct contact in regard to their website.	Marked by 0 or 1.
T1c: provides obvious tailoring indicating agency itself has ownership of site content	Tests how much agency is involved with content of its website.	Marked by 0 or 1.
T1d: provides published date (e.g. "2/15/01" or “February 15, 2001”) on main page or, if none, a key subordinate page, within the last year, or 0 if no date listed on any of these pages	Tests the extent to which website is actively attended to by organization staff. Does not include regular updates to top official’s speeches as press releases. Was "Freshness" indicator prior to 2001?	Marked by giving date in format "2001FEB15" as text, not number
Contacts/Reachability		
T2a: provides central agency non-email addresses	Tests if agency can be contacted by regular, non-electronic mail.	Marked by 0 or 1.
T2b: provides phone numbers or postal addresses for employees within agency beyond most senior officials	Tests if agency provides phone numbers and/or addresses for employees within agency, excluding their managers or any other top level officials.	Marked by 0 or 1.
T2c: provides e-mail address to person responsible for both content of the site and technical	Test if one person performs both editorial/content and technical functions.	Marked by 0 or 1.

support for the site		
T2d: provides e-mail address to someone solely responsible for technical support for the site	Tests if web operation functions are differentiated among several people, testing here for technical support.	Marked by 0 or 1.
T2e: provides e-mail address to someone solely responsible for content of the site	Tests if web operation functions are differentiated among several people, testing here for editorial or content support.	Marked by 0 or 1.
T2f: does the person responsible for technical support for the site NOT appear to be a commercial firm	Tests if agency has out-sourced technical support for website.	Marked by 0 or 1.
Organizational Information		
T3a: provides details on senior official's experiences or vision of future for organization	Tests if agency provides any information about/by/for head official of agency.	Marked by 0 or 1.
T3b: provides mission statement and various activities of agency	Tests if agency provides any data as to what function it serves, what its goals and values are, and how it accomplishes these goals.	Marked by 0 or 1.
T3c: provides organizational structure in graphic form (give "1" for having org chart, add "0.1" for every level)	Tests if agency provides an organizational graphic (such as a flow chart).	Marked by 1 for having an organization chart, and adding 0.1 for each level shown in graphic.
Issue Information		
T4a: provides issue related other government addresses	Tests if agency provides addresses (URL or regular mail) of other government agencies (or within agency itself) whose function is related to this agency.	Marked by 0 or 1.

T4b: provides non issue related other government addresses	Tests if agency provides addresses (URL or regular mail addresses) of any other government agencies (or within agency itself) that are not related to agency at all.	Marked by 0 or 1.
T4c: provides issue-related other non-governmental information source	Tests for same as T4b, but address must be for a non-government source.	Marked by 0 or 1.
T4d: provides reports, research, laws, and regulations in easily readable format on screen	Tests if agency has taken time to provide an easily readable, organized, format for reports, research, laws and regulations.	Marked by 0 or 1.
T4e: provides a searchable index for archived newsletters, laws, regulations, and requirements	Tests if agency allows user to search to site for old newsletter, laws, regulations, or anything relating to content agency provides online.	Marked by 0 or 1.
T4f: provides all downloaded or printed publications for free	Tests if agency makes all information freely available.	Marked by 0 or 1.
T4g: provides link to or text of public information law or regulation	Tests if agency provides the rules under which citizens are entitled to public information.	Marked by 0 or 1.
Citizen Consequences/Responses		
T5a: provides in depth explanations of requirements imposed on citizens resulting from agency activities	Tests if agency provides any data on regulations, laws, or research which agency carries out or is related to agency.	Marked by 0 or 1.
T5b: provides instructions on how to complete these actions. An extension of previous attribute,	Tests if agency provides citizens with instructions, help, tips on how meet requirements/regulations/laws imposed by agency	Marked by 0 or 1.

	(such as providing instructions on how to file a tax form).	
T5c: provides instructions for appeal process for decisions or address of an ombudsman inside agency	Tests if agency provides – online -- instructions and/or a way for citizens to appeal agency decisions.	Marked by 0 or 1.
Coding Criteria: Interactivity or Accessibility		
Security and Privacy		
I1a: does NOT use information gathering techniques such as cookies to gather information about site visitors	Tests whether site uses techniques such as cookies or web bugs to gather information about user access or behavior on the site, thereby providing a degree of privacy to site visitor.	Marked by 0 or 1.
I1b: does NOT require personal information (beyond return e-mail address) to communicate with agency	Tests whether site requires that users provide any other information than e-mail return address as a condition of communicating with the agency, thus providing a degree of anonymity to site visitor.	Marked by 0 or 1.
I1c: site entails use of security access method, such as a password, or transfers user to secure server (https://...)	Marked by 0 or 1.	
I1d: security access method, such as password or secure server use, appears to be associated with transaction or access to personal information	Tests whether site access involving transmission of sensitive or personal information is accompanied by use of security feature such as passwords or secure servers.	Marked by: +1 if site IS associated with financial transaction or access of personal information; 0 if don't know or none found; -1 if site is NOT associated with financial transaction or citizen accessing personal information.

Contacts/Reachability		
I2a: provides e-mail link to webmaster	Tests if e-mail link to webmaster is (a mailto link).	Marked by 0 or 1.
I2b: provides e-mail link to senior agency official	Tests if the e-mail link to any senior officials is clickable.	Marked by 0 or 1.
I2c: provides e-mail link to a number of agency employees	Tests if agency provides e-mail links to a large portion of its employees.	Marked by 0 or 1.
I2d: agency avoids dictating format or content of citizen communication, e.g., no preset subject or manual insertion of contact information	Tests if agency attempts to reduce transaction costs in citizen-agency communications.	Marked by 0 or 1.
I2e: provides an online issue-related forum for outsider participation such as chat lines, and listserves.	Tests if agency provides a chat line or listserve for citizens, agency employees and other interested individuals to discuss topics related to agency.	Marked by 0 or 1.
Organizational Information		
I3a: provides link to listed sub-elements within agency (give "1" for having org chart, add "0.1" for every sub-element hotlinked)	Tests if subdivisions within agency have a link made to them from main page.	Marked by giving 0.1 for each link provided.
I3b: provides link to sublevels noted in agency's organizational structure graphic (give "1" for having org chart, add "0.1" for every level)	Tests if elements within agency's organizational graphic (such as area for president, vice president, etc) are clickable.	Marked by 0.1 for each element available to be clicked.
I3c: provides automatic update announcement or newsletter via subscription	Tests if agency has a newsletter, either hard copy or email, which user can subscribe to which provides up to date information about agency and its activities.	Marked by 0 or 1.

Issue Information		
I4a: provides link to outside issue-related government addresses	Test if addresses provided are clickable.	Marked by 0 or 1.
I4b: provides link to outside non-issue-related government addresses	Tests if addresses provided are clickable.	Marked by 0 or 1.
I4c: provides link to outside issue-related non-governmental information sources	Tests if addresses provided are clickable.	Marked by 0 or 1.
Citizen Consequences/Responses		
I5a: provides any required submission forms onscreen for download (give 0.1 for every form accessible for download)	Tests if user can easily download any forms needed/required by agency for compliance with certain laws/regulations.	Marked by giving 0.1 for each form available for download.
I5b: provides online form completion and submission (give 0.1 for every form accessible for online completion and submission).	Tests if user can complete and submit a form online to agency.	Marked by giving 0.1 for every form available for online completion and submission.
I5c: provides an automatic response limit for response to online submissions This attribute notes if agency tells user how long it will take until he/she receives a response from agency	Marked by 0 or 1.	
I5d: provides link to appeal process for decisions and/or an ombudsman	Tests if appeals process provided is and easy to use.	Marked by 0 or 1.
I5e: provides other language access to site for visitors unable to speak or read the language of the host country	Tests if site provides other language than principal language of the country. If country is officially multilingual, at least two official languages are used	Marked by 0 or 1.

	on site.	
I5f: provides iconographic access to site for visitors unable to speak or read the language of the host country	Tests if site provides icons or images that help users with limited reading or text processing skills to make rudimentary use of site.	Marked by 0 or 1.
I5g: provides audio access to site	Tests extent to which site provides audio services, either for visually impaired users, or to capture verbal agency activities, such as hearings, presentations or speeches.	Marked by 0 or 1.
I5h: disability access score: "Priority 1 Accessibility" and "User Checks"	Tests extent to which site is accessible to disabled users, using evaluation criteria of the Center for Applied Special Technology, http://www.cast.org/bobby. * The lower the score, the more accessible the site.	Marked by basic accessibility measure (Priority 1 Accessibility) to left of decimal, and number of "user checks" for first level of accessibility to right of decimal. Thus, "0.3" indicates no errors, three things to check, "2.8" means two major errors, eight things to check.

Source: CyPRG (CyPRG)

Appendix 2: Kenya Government Websites

Kenya Government Websites: http://www.kenya.go.ke/

e-Government Website: http://www.e-government.go.ke/

Guide to Government of Kenya:
http://www.kenya.go.ke//index.php?option=com_content&task=blogsection&id=5&Itemid=17

Websites of Ministries of the Government of Kenya
http://www.kenya.go.ke//index.php?option=com_content&task=view&id=36&Itemid=1

1. OFFICE OF THE PRESIDENT
   MINISTRY OF STATE FOR PROVINCIAL ADMINISTRATION AND INTERNAL SECURITY
   MINISTRY OF STATE FOR DEFENCE
2. OFFICE OF THE VICE PRESIDENT AND MINISTRY OF HOME AFFAIRS
   MINISTRY OF STATE FOR IMMIGRATION AND REGISTRATION OF PERSONS
   MINISTRY OF STATE FOR NATIONAL HERITAGE AND CULTURE
3. OFFICE OF THE PRIME MINISTER
   MINISTRY OF STATE FOR PLANNING, NATIONAL DEVELOPEMENT AND VISION TWENTY- THIRTY
   MINISTRY OF STATE FOR PUBLIC SERVICE
4. OFFICE OF THE DEPUTY PRIME MINISTER AND MINISTRY OF TRADE
5. OFFICE OF THE DEPUTY PRIME MINISTER AND MINISTRY OF LOCAL GOVERNMENT
6. MINISTRY OF EAST AFRICAN COMMUNITY
7. MINISTRY OF FOREIGN AFFAIRS
8. MINISTRY OF FINANCE
9. MINISTRY OF JUSTICE, NATIONAL COHESION AND CONSTITUTIONAL AFFAIRS
10. MINISTRY OF NAIROBI METROPOLITAN DEVELOPEMENT
11. MINISTRY OF ROADS
12. MINISTRY OF PUBLIC WORKS
13. MINISTRY OF TRANSPORT
14. MINISTRY OF WATER AND IRRIGATION
15. MINISTRY OF REGIONAL DEVELOPEMENT AUTHORITIES
16. MINISTRY OF INFORMATION AND COMMUNICATION
17. MINISTRY OF ENERGY
18. MINISTRY OF LANDS
19. MINISTRY OF ENVIROMENT AND NATURAL RESOURCES
20. MINISTRY OF FORESTRY AND WILDLIFE
21. MINISTRY OF TOURISM
22. MINISTRY OF AGRICULTURE
23. MINISTRY OF LIVESTOCK DEVELOPEMENT
24. MINISTRY OF FISHERIES DEVELOPEMENT
25. MINISTRY OF DEVELOPEMENT OF NORTHERN KENYA AND OTHER ARID LANDS
26. MINISTRY OF COOPERATIVES DEVELOPEMENT

27. MINISTRY OF INDUSTRIALIZATION
28. MINISTRY OF HOUSING
29. MINISTRY OF SPECIAL PROGRAMMES
30. MINISTRY OF GENDER AND CHILDREN AFFAIRS
31. MINISTRY OF PUBLIC HEALTH AND SANITATION
32. MINISTRY OF MEDICAL SERVICES
33. MINISTRY OF LABOUR
34. MINISTRY OF YOUTH AND SPORTS
35. MINISTRY OF EDUCATION
36. MINISTRY OF HIGHER EDUCATION, SCIENCE AND TECHNOLOGY
37. OFFICE OF THE ATTORNEY GENERAL

Appendix 3: Content Analysis Data Tables

Table 1: Stages Percentage Scores by Ministries and Functional Categories

Ministry	Catalogue	Transactions	Vertical Integration	Horizontal Integration	Functional Category
President/Cabinet	90	54	57	80	Admin
President/Defence	60	23	29	0	Admin
President/Security	80	38	57	80	Admin
Public Communication	90	77	71	80	Admin
Director. of e-Government	90	77	71	100	Admin
National Econ and Social Council	80	23	57	80	Admin
VP/ Home Affairs	20	23	14	0	Admin
National Heritage	70	23	0	40	Admin
Prime Minister	70	62	57	80	Admin
Planning	90	23	43	60	Admin
Public Service	50	38	29	20	Admin
Deputy PM/Loc Gov	50	38	43	60	Admin
EAC	100	85	86	100	Admin
Foreign Affairs	100	77	71	80	Admin
Finance	90	31	43	60	Admin
Justice	0	0	0	0	Admin
Lands	40	15	14	0	Admin
Labor	80	54	57	100	Admin
Attorney-General	60	69	71	60	Admin
Immigration	80	15	43	40	Service
Deputy PM/Trade	40	23	29	0	Service
Tourism	90	92	86	100	Service
Agriculture	100	54	71	80	Service
Livestock	60	38	43	60	Service
Gender and Children	100	77	43	60	Service
Public Health	0	0	0	0	Service
Education	80	31	57	100	Service
Transport	90	69	71	100	Service
Information	90	92	86	100	Service
Medical Services	100	77	57	100	Service
Fisheries	70	31	43	80	Service
Higher Education	70	54	57	100	Service
Nairobi Metro	100	62	71	100	Dev
Roads	100	54	57	80	Dev
Public Works	90	46	57	100	Dev
Water	90	92	86	100	Dev
Regional Dev.	100	85	86	100	Dev
Energy	70	31	29	40	Dev
Environment	100	23	29	80	Dev
Forestry	100	92	71	80	Dev
Cooperatives	100	85	86	100	Dev
Industrialization	100	100	86	100	Dev
Housing	100	69	57	100	Dev
Special Programme	60	46	29	40	Dev
Youth Affairs	80	62	57	100	Dev
Northern Kenya	0	0	0	0	Dev

Table 2: Mean Scores by Ministry Categories and by Stages

	Stages			
Ministry by Function	Catalogue	Transactions	Vertical Integration	Horizontal Integration
Admin.& Reg	92.00	75.33	92.00	75.33
Development	90.67	88.67	90.67	88.67
Services	90.67	88.67	90.67	88.67

Table 3: Chi-Square Statistics Difference in Significance between Categories

	Stages			
	Catalogue	Transactions	Vertical Integration	Horizontal Integration
Pearson Chi-Square	4.667	12.690	3.435	12.197
Df	2	2	2	2
Asymp. Sig. (2-sided)	0.097	0.002	0.179	0.002
Statistical Difference between Functional Groups	NO	YES	NO	YES

Table 4: Kruskal Wallis and Mann-Whitney Tests

Table 1: Stages * Yes/No Crosstabulation

			No/Yes Scores		
			No	Yes	Total
Stages	1	Catalogue	48	142	190
	2	Transactions	142	105	247
	3	Vertical Integration	73	60	133
	4	Horizontal Integration	42	53	95
Total			305	360	665

Table 5: Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.388[a]	3	.000
Likelihood Ratio	52.176	3	.000
N of Valid Cases	665		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 43.57.

Table 6: Chi-Square Post Hoc

Frequency Table

		Stage1	Stage2	Stage3	Stage4
N	Valid	46	46	46	46
	Missing	138	138	138	138
Mean		75.43	50.65	51.24	67.83
Median		85.00	54.00	57.00	80.00
Mode		100	23	57	100
Std. Deviation		27.945	28.109	25.254	35.647
Variance		780.918	790.143	637.742	1270.725
Skewness		-1.460	-.029	-.510	-.921
Std. Error of Skewness		.350	.350	.350	.350
Kurtosis		1.619	-1.081	-.441	-.471
Std. Error of Kurtosis		.688	.688	.688	.688
Range		100	100	86	100
Minimum		0	0	0	0
Maximum		100	100	86	100
Percentiles	10	34.00	15.00	9.80	.00
	20	60.00	23.00	29.00	40.00
	25	60.00	23.00	29.00	40.00
	30	70.00	31.00	43.00	60.00
	40	80.00	38.00	43.00	76.00
	50	85.00	54.00	57.00	80.00
	60	90.00	62.00	57.00	80.00
	70	90.00	69.00	71.00	100.00
	75	100.00	77.00	71.00	100.00
	80	100.00	77.00	71.00	100.00
	90	100.00	92.00	86.00	100.00

Table 7: Descriptive Statistics

	N	Mean	Std. Deviation	Min.	Max.	Percentiles 25th	Percentiles 50th (Median)	Percentiles 75th
StagesPct	184	61.29	31.153	0	100	40.00	69.00	86.00
StagesDig	184	2.50	1.121	1	4	1.25	2.50	3.75

Table 8: Kruskal-Wallis Test - Ranks

	StagesDig	N	Mean Rank
StagesPct	1	46	118.53
	2	46	71.41
	3	46	71.78
	4	46	108.27
	Total	184	

Table 9: Test Statistics[a, b]

	StagesPct
Chi-square	29.411
df	3
Asymp. Sig.	.000

a. Kruskal Wallis Test
b. Grouping Variable: StagesDig

Kruskal-Wallis Post-hoc Tests

Table 10: Descriptive Statistics

	N	Mean	Std. Deviation	Min.	Max.	Percentiles 25th	Percentiles 50th (Median)	Percentiles 75th
Stages14	92	71.63	32.081	0	100	60.00	80.00	100.00
Stages14	92	2.50	1.508	1	4	1.00	2.50	4.00

Table 11: Kruskal-Wallis Test - Ranks

	Stages14Dig	N	Mean Rank
Stages14Pct	1	46	48.08
	4	46	44.92
	Total	92	

Table 12: Test Statistics[a, b]

	Stages14Pct
Chi-square	.336
df	1
Asymp. Sig.	.562

a. Kruskal Wallis Test
b. Grouping Variable: Stages1 and 4

Mann-Whitney Test

Table 13: Test Statistics[a]

	Stages14Pct
Mann-Whitney U	985.500
Wilcoxon W	2066.500
Z	-.579
Asymp. Sig. (2-tailed)	.562

a. Grouping Variable: Stages14Dig

Table 14: Ranks

	Stages14Dig	N	Mean Rank	Sum of Ranks
Stages14Pct	1	46	48.08	2211.50
	4	46	44.92	2066.50
	Total	92		

Table 15: Kruskal – Wallis Test: Stages 1 and 2

Descriptive Statistics

	N	Mean	Std. Deviation	Min.	Max.	Percentiles		
						25th	50th (Median)	75th
Stages12Pct	92	63.04	30.531	0	100	38.00	70.00	90.00
Stages12Dig	92	1.50	.503	1	2	1.00	1.50	2.00

Table 16: Ranks

	Stages12Dig	N	Mean Rank
Stages1&2 Pct	1	46	58.20
	2	46	34.80
	Total	92	

Table 17: Test Statistics[a, b]

	Stages12Pct
Chi-square	17.768
df	1
Asymp. Sig.	.000

a. Kruskal Wallis Test
b. Grouping Variable: Stages1 & 2 Dig