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Human Factor Issues In The Use Of E-Government Services Among Ghanaian Middle Age Population: Improving Usability Of Existing And Future Government Virtual Interactive Systems Design

OWUSU-ANSAH SAMUEL
UNIVERSITY OF GHANA, LEGON, INFORMATION STUDIES DEPARTMENT
E-MAIL: samsfire55@gmail.com

ABSTRACT

It is an undisputable fact that the world is changing at a very fast pace. It therefore requires a change if every organization and institution are to respond to these changes. It is for these reasons that government needs to take initiative in order to stimulate its citizens to adopt and embrace the use of ICT, using usability engineering as a tool to iimprove the existing and future government Virtual Interactive Systems designthem to give off the best leading to an increase in work performance.Given the fact that more and more governments in Europe and Africa invest heavily in e-government design and implementation, e-government has become an evolving and important research area in the IS (Information System) field. A mixed methodology (quantitative and qualitative) was adopted whilst the purposive sampling was used to select respondents of the study. The main instrument used in gathering data was questionnaire.

The results indicated that the e-government services have transformed how government relates itself to its citizenry. About (38.1%) of respondents identified that an improved usability or system interface was a major reason for the adoption and usage of e-government service and vice versa**.** However, there were some suggestions and recommendations on how to improve the human factor issues in the adoption and use of e-government services among the middle age population in Ghana with purpose of improving usability of existing and future government virtual interactive systems design, which include establishment of Public Authority for e-government projects, improvement of Payment systems, e-government campaign, improvement of ease of use of services, enhance training of personnel, interactive interfaces and effectiveness of the system design.

1.1 Introduction

The information and Communication Technology (ICT) insurgency, especially fast technological advancement of the Internet as well as the declining prices for the use of this technology has dramatically changed how citizens interact with their ministries and government and therefore creating a significant development in their hopes (Dodd, 2000).

Following the electronic commerce's advancement in the private sector, electronic government, i.e. e-government, seems to be the next step in the public sector administration. Rana et al. (2012) underscored that many governments in Africa and Europe are modernizing themselves into an innovative form called electronic government or e-government (Akman et al., 2005) for strengthening and keeping themselves in the global competition. According to Bose (2004), e-government is the application of ICT, including an Internet to the advancement and innovation in, and improvement of government services to its citizenry.

E-government refers to the use of information technology (IT) by governments to enhance the access and delivery of its information and service to the citizens, business partners, professionals, other organizations, and even government entities(McClure, 2000; Symonds, 2000; West, 2004) themselves. Its primary purpose is to improve the liability and functioning of the government operations. These activities incorporate government services delivery, access to government information, and participation by citizens and businesses (DeBenedictis, 2002). According scholras like Dwivedi and Williams, 2008; Dwivedi et al.,2006; Ke and Wei, 2004; Tan and Subramaniam, 2005, e-governments platforms impart a range of benefits such as low-cost, high speed, responsible, and reliable services not only to governments, businesses, but extensively to citizens as well (Jaeger, 2003).

It has become a common focus of government efforts and abilities in many developed nations such as Australia (Teicher & Dow, 2002) UK (Beynon-Davies, 2005) and more recently in several developing countries like Dubai (World Bank, 2002). It has been established that most existing research on e-government has focused on western developed states (Ho, 2002; Leitner, 2003; Choudrie et al., 2005). Among those that focused on e-government implementation within developing states, only a few have emphasized several issues and obstacles that need to be confronted (Atallah, 2011 and Ndou, 2004).

As it is mentioned earlier and also as a reason for doing this research, the previous researches in this area (e-government services among the middle age population in Ghana: improving usability of existing and future

government virtual interactive systems design) are limited in number and also suffering from methodological weaknesses.

Choudrie et al. (2005) has suggested that there is indeed an importance in investigating issues over time with respect to e-government at the public or local level. In this current study, the main objective is to recognize the nature of usability in e-government services and also the need to explore this matter from identified or targeted population of Ghana so a composite model has been used to as a base of for designing themes for questions. Knowing that the researcher has accepted the definitions of e-government and usability engineering, and also using these two terminologies, in assessing the human factor issues in adopting and use of e-government services on government's websites in the State of Ghana, exploratory model is chosen for this study. The researcher identified three factors that are critical to the study; the e-government services, the usability of government websites, and problems that are associated with e-government services and usability of government's websites. Given this context, this study attempts to address and explore in a Ghana perspective by accessing e-government services, using usability engineering to explore the human factor in the use of government websites. Thereby aiming at improving the usability of the existing and future government virtual interactive systems design.

However, the following were the research questions of the study:

- What are the various e-government services used by the middle age population?
- Evaluate the usability features of e-government services or programmes?
- Are there major problems, challenges and success factors in the implementation of e-government services?

1.1.1 Background of e-government

The term electronic government or e-Government has become a global phenomenon and is seen as an apparatus to support the routine and performance of government and public administration. The term e-Government (e-Gov) developed in the late 1990s, but the history of computing in government organizations can be traced back to the early periods of computer history. A literature on "IT in government" goes back at least to the 1970s (Kraemer, et al, 1978, Danziger and Andersen, 2002). This literature apprehends IT use within government, while the recent e-Gov literature more often concerns external use, such as services to the citizens through the assistance of Internet (Ho, 2002). Although some earlier e-Gov computer issues, such as office automation, may not be exceedingly significant to research today, many issues are, for example decision making, service processes, and values. As discussed in the earlier section, all definitions of e-Gov go beyond services to the citizen to include organizational change and the role of government in delivery services to its citizens.

The Government of Ghana has been striving to improve its services to its citizens. It has been established over the past few years that, ministries and government entities have implemented projects that have improved certain IT services. This was achieved by systematizing or automating manual processes in demand to decrease the time and effort involved in delivering the service by using the best (IT) equipment available at the time. For instance, in the year 2000, the Cabinet of Ministers issued a decree forming a Ghana e-government Committee headed by the Prime Minister. The committee's was tasked to design a vision for e-government projects in Ghana. Since then, Ghana has taken big steps towards implementing and improving its e-government projects. This initiative however, enabled Ghana to boast of websites for its ministries and other government agencies.

The introduction of e-government services has enabled the following ministries and government agencies to own independent websites. These are: Ministries of Local Government and Rural Development, Ministry Of Fisheries And Aquaculture Development, Ministry For The Interior, Ministry Of Foreign Affairs And Regional Integration, Ministry Of Defense, Ministry of Water Resources, Works & Housing, Ministry of Transport, Ministry of Trade and Industry, Ministry of Tourism, Culture and Creative Arts, Ministry of Roads and Highways, Ministry Of Youth And Sports, Ministry of Lands and Natural Resources, Ministry of Justice & Attorney General, Ministry of Information and Media Relations, Ministry of Health, Ministry of Gender, Children and social protection, Ministry of Food & Agriculture, Ministry of Finance, Ministry of Environment, Science, Technology and Innovation, Ministry of Energy and Petroleum, Ministry of Employment and Labour Relations, Ministry of Education, Ministry of Communications and Ministry of Chieftaincy and Traditional Affairs (www.ghana.gov.gh).

1.2 Literature Survey and Related Works

1.2.1 Definition of Concepts

E-government, being the focus of the study, countless definitions has been given by researchers. In this study, the researcher uses e-government and e-governance interchangeably. Readers should not be confused on the

usage of the terms. Although the definitions of e-government may vary widely, there is common theme. However, e-government or e-governance is a generic term for web-based services from actors of local, state and federal governments. It can be defined as government using ICT, and predominantly the Internet to support government processes, procedures, actions, tasks, operations, and so on, to engage citizens, and to provide government services (Bedi, Singh and Srivastava, 2001; Holmes, 2001; Okot-Uma, 2000). It is using ICTs at countless levels of the government and the public sector and beyond, for the purpose of improving governance of a state or a nation. The interactions may take different forms in obtaining information from government's websites, filing of electronic forms online, or making payments and many other activities by the use of the Internet.

To start with, the researcher would like to define government and e-government and how human issues are handled when it comes to adoption of e-governance to manage and administer public services. Government can be said to be a system of ruling, controlling a state's resources. It can also be seen as an established system of political administration by which a state or nation etc. is governed. According to Downer (2000), government is a body that has political, economic, administrative power or authority to manage a country's resources and affairs. It encompasses the mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences'.

However, the concept of government is not static and do not apply in a uniform way in all places and cultures. Therefore, at this point it is prudent to adopt the United Nations Development Programme (UNDP) definition of government. UNDP recognizes that the terminology of government needs to be defined in order to provide a common understanding of them for the organizations and bodies of the United Nations system. The United Nations Development Programme (UNDP), in its 1997 policy paper 3, defined government as "the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences". Apart from the UNDP, the definitions mention government as the process through which power is applied in the administration of a country's political, economic and social resources for development.
The World Bank Group (2009) stats that e-Government is the use of "agencies of information technologies" for example wide area networks (WAN) and the internet that are able to change or transform the relationship between businesses, citizens and other sectors of government. One of the German government objective is to have its citizens participate in the activities of government (Khosrow-Pour, 2005:22).

From the researcher point of view, there are many similarities in the definitions given in above paragraphs. The researcher therefore summarizes the definitions of e-government as the conveyance of national or local government information and services using the Internet or other means of communication to citizens, businesses, NGOs, other governmental agencies within a state. However, the implementation of e-government by states, the researcher believe is to facilitate provisions of relevant government information in electronic form or any other form to the citizens in a timely manner, to improve service delivery to citizens, to empower the publics through access to information without bureaucracy, to enhance productivity and cost savings in doing business with customers and suppliers of government, and also to participate in public policy decision making.

However, for the researcher to achieve the objective of the study, it is important for the study to operate in a certain scope. Nonetheless, study focuses on assessing the human factor issues in the adoption and use of e-government services among the middle age population in the State of Ghana. The researcher delves into the adoption and the usability of e-government by citizens in order to improve existing and future government virtual interactive systems design. The following sub headings review literatures to that effect.

1.2.2 Classifications of e-governance

From the above definitions, e-government can be viewed as involving interactions and relationships among citizens, governmental agencies and other stakeholders, using ICT and internet with the purpose of improving government's transactions with citizens and all stakeholders of governments. In other words, government relationships with its stakeholders could take the form of;

- Government to Citizens (G2C)
- Government to Government (G2G)
- Government to Business (G2B)

- Government to Employees (G2E)

1.2.2.1 Government to Citizens (G2C)

This is where government relates with its citizens. The aim of e-government here is to offer and deliver appropriate support for the citizens anywhere and at any time by enabling its citizens to access or perform on-line activities or transactions, such as applying online for employment and searching for contracts details of public departments (World Bank, 2002: Ndou, 2004; Bose, 2004; Heeks, 2002). Furthermore, G2C allows and empowers citizen to contribute and partake in decision making processes on issues that affects them and/or are of interest to the citizens (i.e. via internet). The relationship between government and its citizens enhances the quality or add values to citizens' lives by providing them with a quality of government services.

1.2.2.2 Government to Government (G2G)

This is the interrelationship between government other international governments and/ or within government itself. According to Bose (2004) and Ndou (2004), the main objective and aim of government to relate to its other government agencies and international governments is to enhance cooperation at different levels and to facilitate communication between government offices in different locations.

1.2.2.3 Government to Business (G2B)

The objective of government is to relate business organizations to enhance electronic transactions. Business organizations and citizens carry out electronic transactions with government, for example being renewing business registration certificates, paying of taxes and downloading application forms, just to mention but a few. As cited by Carter and Belanger, (2004) and McClure (2001), the relation between government and business organizations enable government creates an environment that enables and assists administrative requirements for new and the already existing businesses.

1.2.2.4 Government to Employees (G2E)

This is concerned with creating the platform for employees to interact with government. The main objective here is to increase productivity of both employees and the government. This can be ensured by government in interacting effectively with its employees. G2E services may include information on government policies, procedures, rules, civil rights (World Bank, 2002) as well as email and e-learning capabilities.

From the above classifications there seem to be two main types of interaction occurring between government and other parties, these being: between individuals and government and between government and business organizations and government on the other. However, the classification above is to earth out how government relates with its stakeholders by the use of interactive system to reach its clients, being: employees, within its government, business organizations, citizens and other agencies that has transactions to do with the government.

1.3 Benefits of E-government Services

According to Ndou (2004), the benefits of the use and application of e-government are the same for both developing and developing countries. However, the following sections discuss some of the benefits of the use and application of e-government services.

Table 2.1 below summarizes the benefits of e-government

Outlook	Benefits	Source
Government	i. Time and money saving ii. Quality services improvement iii. Improving economic competitiveness iv. Aggregating accountability v. Reduction of errors vi. Driver for other companies	(IDABC, 2005; Liao and Cheung, 2002; Capgemini, 2004; Foley; UN, 2001)
Citizens and business organizations	i. Availability of public services 24/7 ii. Increasing citizen participations in government decision making iii. Improved in the relationship between government and citizens and business organizations iv. Bridging the digital divide v. Improvement in transparency	(Carbo & Williams, 2004; IDABC, 2005; Seifert, 2003)

From a governmental outlook, one of the main benefits of e-government implementation is to improve administrative efficiency, thereby installing ICT and internet within government departments. This could result in the minimization of errors, time and money saving (IDABC, 2005; Liao and Cheung, 2002; Capgemini, 2004; Foley; UN, 2001). The aim of e-government is to reduce corruption, bureaucracy and offer access to government services 24/7 (Ndou, 2004). E-government also enhances public sector agencies to improve their services processing and delivery capabilities, while reducing time and staff number. E-government can enhance economic competitiveness by "streamlining bureaucratic procedures and increasing public sector efficiency, e-government plays a significant role in raising productivity levels in the economy as a whole" (IDABC, 2005, p.13). However, from the researcher's perspective, facilitating e-government whereby information will be exchange between government departments, there will be effectiveness of government policies in area such as health, public safety, education, etc. (IDABC, 2005). Furthermore, the implementation of e-government will also enhance more accountability of the government itself by enabling more effective systems in observing and controlling of government's services.

One of the benefits e-government promises is the "spilling over" use inside other organizations (UN, 2001). From the United Nations perspective, government that transacts most of its business online can be influence by other business organizations to do the same, "thus spreading the efficiency gains to the economy as a whole" (UN, 2001.p.31).

The implementation of e-government services can also lead an increase in participation by citizens through the use of ICT. For example, citizens can use an interactive features or interface such as web *comment forms and online consultation,* I to provide government with views on public policies, in other words, participating fully in the administration of a state.

1.4.1 The Research Context: Ghana's e-government

The revolution of ICT age in Ghana has transformed the relationship among government's agencies, businesses and citizens. With the introduction of ICT to enhance public services, e-governance has transformed the internal workings of public administrations and the manner in which government interacts with their populace. This transformation has affected the model and protocol of interaction in extra-government and intra-government communications. The effect of this revolution has been a new relationship in government-to-citizen, government-to-business, most prominently, in government-to-government (G2G) communications that are now Web based. According to Boujarwah (2006), 'considering that governments are mainly information producers,

rather than information receivers, the Internet presents itself as the ideal intermediary, becoming the 24/365 passive call center for government-citizen interaction'.

Governments all over the world, and including Ghana, are taking advantage of internet technologies, and are supporting several e-government projects aiming at enhancing their own performance and productivity as well as that of their citizenry and businesses alike. The government of Ghana administrations has acknowledged that an e-government can be regarded as the gateway to a National Web Depository.

Over the past two decades, the Government of Ghana has always been striving to improve its services. Not quite long ago, the ministries and government entities in Ghana like Information and Communication have implemented projects that have improved certain services substantially. These projects were accomplished by automating government's manual processes and procedures in order to decrease the time and effort involved in providing services by using the ICT.
For each site a brief description is given describing the functionality of the site and its interactivity. The Table 2.1 below shows the names of ministries/government agencies, websites and their functions.

Table 2.1: Ghana's Ministries' Websites and their Functions

Ministries/government agencies	Websites	Functionality
Ministries of Local Government and Rural Development	www.mlgrdghanagov.com	Exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana lo ensure good governance and balanced rural based development.
Ministry Of Fisheries And Aquaculture Development	www.mofa.gov.gh	Contributes significantly to national economic development objectives related to employment, livelihood support, poverty reduction, food security, foreign exchange earnings and resource sustainability
Ministry For The Interior	www.mint.gov.gh	Ensures internal security, as well as the maintenance of law and order in the country.
Ministry Of Foreign Affairs And Regional Integration	www.mfa.gov.gh	
Ministry Of Defense	www.gaf.mil.gh	Protects the territorial integrity and national resources.
Ministry of Water Resources, Works & Housing	www.ghana.gov.gh	Responsible for the formulation and co-ordination of policies and programmes for the systematic development of the country's infrastructure requirements in respect of Works, Housing, Water Supply and Sanitation and Hydrology
Ministry of Transport	www.mot.gov.gh	Responsible for the formulation, coordination and monitoring of Aviation, Transport and Highway infrastructure policies and programmes for both public and private sectors of the economy.
Ministry of Trade and Industry	www.moti.gov.gh	Responsible for the formulation, implementation and monitoring of Ghana's internal and external trade. It is the sector ministry that ensures that Ghana derives maximum benefit from internal trade relations and that domestic trade is conducted in a smooth and orderly manner.
Ministry of Tourism, Culture and Creative Arts	www.ghanatourism.gov.gh	Ensures the development and promotion of tourism and improvement of the capital city on a sustainable basis.
Ministry of Roads and Highways	www.mrt.gov.gh	Provides and maintain an integrated, cost-effective and sustainable road transport network responsive to the needs of users, supporting growth and poverty reduction"

Ministry Of Youth And Sports	www.moys.gov.gh	Exists to formulate Youth and Sports policies; monitor and evaluate policy implementation to achieve national integration and international recognition; promote youth empowerment and self-development; and provide enabling environment for sports development, organization and promotion.
Ministry of Lands and Natural Resources	www.ghana.gov.gh	To ensure the sustainable management and utilization of Ghana's lands, forests, wildlife and mineral resources for socio-economic growth and development.
Ministry of Justice & Attorney General	www.ghana.gov.gh	Exists to entrench at the core of the body politic and abiding respect for the Rule of Law and a constant observance of human Rights, to ensure equality of access to Justice and treatment before the Law for all citizens, to promote by law social justice to facilitate the operations of a fair, efficient and transparent legal system and to propagate a culture of due process and legality for these purposes.
Ministry of Information and Media Relations	www.ghana.gov.gh	Exists to facilitate a two-way free flow of timely and reliable information and feedback between the Government and its various publics and to assist in the development, co-ordination of policy; to monitor and evaluate the implementation of programmes and activities by the Sectors Agencies.
Ministry of Health	www.ghana.gov.gh	Seeks to improve the health status of all people living in Ghana, through the development and promotion of proactive policies, provision of universal access to basic health service, and the provision of quality and affordable health services.
Ministry of Gender, Children and social protection	www.ghana.gov.gh	Exists to promote the welfare of women and children in Ghana. It is the entity designated by government to initiate, coordinate and Monitor gender responsive issues. It is to ensure equal status for women and promote rights of children.
Ministry of Food & Agriculture	www.mofa.gov.gh	Charged with the development and growth of agriculture in the country with the exception of the Cocoa-Coffee and Forestry sector. Its primary roles are the formulation of appropriate agricultural policies, planning & co-ordination, monitoring and evaluation within the overall national economic development.
Ministry of Finance	www.mofep.gov.gh	Restructuring the allocation of funds, accounting and reporting, cash flow management, asset management, debt management, internal controls, procurement and financial statements to move Ghana away from poverty and to promote economic prosperity.
Ministry of Environment, Science, Technology and Innovation	www.ghana.gov.gh	Exists to establish a strong national scientific and technological base for accelerated sustainable development of the country to enhance the quality of life for all.
Ministry of Energy and Petroleum	www.energymin.gov.gh	To develop and ensure reliable supply of high quality energy services at minimum cost to all sectors of the economy through the formulation, implementation, monitoring and evaluation of policies.
Ministry of Employment and Labour Relations	www.ghana.gov.gh	Exists to promote sustainable employment opportunities, management and vocational skills development, training and re-training, harmonious industrial relations, safe and group formation and social integration of vulnerable,

		excluded and the disadvantaged for the development and growth of the economy.
Ministry of Education	www.moe.gov.gh	To provide relevant and quality education for all Ghanaians especially the disadvantaged to enable them acquire skills which will make them functionally literate and productive to facilitate poverty alleviation and promote the rapid socio-economic growth of the country.
Ministry of Communications	www.moc.gov.gh	Enables government develop policies that will help integrate information technologies into the activities of the society and also harness the full potential for effective development
Ministry of Chieftaincy and Traditional Affairs	www.ghana.gov.gh	To preserve, sustain and integrate the regal, traditional and cultural values and practices to accelerate wealth creation and harmony for total national development

Source: www.ghana.gov.gh

1.4.2 Benefits of E-government Services in Ghana

In this section, the focus is on literature regarding e-government implementation in developing countries in Ghana, and the barriers that are encountered. In many developing countries, including Ghana in particular, now have initiatives and have been developing e-government services. The main objectives of these initiatives are to promote transparency, accountability, make public service available at the lowest cost to the public, and at the same time to contribute to improving public service delivery (Heek, 2003).

Since the inauguration of e-government projects in the year 2007, the authorities in Ghana have made important progresses in the provision of online services for citizens, businesses, residents and foreigners. This achievement made it possible for Ghanaian citizens to reach their respective government and other government agencies or ministries online. It also made possible now for citizens to facilitate payment transactions.

Furthermore, studies have emphasised website navigability and aesthetics (Reichheld et al., 2000), personalisation and customisation (Thorbjornsen et al., 2002) and citizen loyalty programs (Sharp and Sharp, 1997) as key strategies for attracting people to frequently visit a website. However, the results of this study can be meritoriously used in building government websites to increase the adoption of e-government. Providing the parallels of Internet adoption in the private corporate sector to e-government adoption, such an approach could enhance the State of Ghana's insights into the key drivers of e-government implementation.

E-gov offers a number of prospective benefits to citizens. It provides citizens with more control on how and when they interact with the government's websites. Instead of one to visit a department at a particular location or at a particular time specified by the government, citizens can choose to receive these services at the time and place of their choice. With the introduction of e-government services, the citizens of Ghana can access government services and this has also increased despite government's limited infrastructure. The electronic delivery of e-government services, particularly the availability of different forms and the option of electronically submitting them, provides a considerable saving of time and money for citizens of Ghana (Boujarwah, 2006). Technology now makes it possible to personalise a website to a point where delivery of services could be tailored to meet the specific needs of an individual, thereby increasing the satisfaction of citizens from government services (Gilber and Balestrini, 2004). The adoption and usage of online government services has a special consequence for developing countries.

The various websites of ministries and government agencies of Ghana have enhanced the delivery of e-government services to the citizens of Ghana. The delivery of e-government services has therefore, immensely increase accessibility and brings significant time and cost savings to citizens in developing countries, such as Ghana. The transparencies built in the e-government services also lessen corruption, a serious problem (Boujarwah, 2006). Therefore, e-Government has virtually revolutionized the provision of e-government services to citizens of Ghana.

1.5 Challenges of E-government Services of Ghana

Although the mainstream of e-government projects in developing countries, especially in Ghana fail, there has been a partial success (Heek, 2003). For instance, in India, one had to spend 15 days to pay property taxes and issue of land registration instead of five minutes (Schware and Deane, 2003). However, amongst the challenges faced by the Ghana e-government projects, the incomplete synchronization of e-services between government agencies' websites and other ministries in Ghana, the absence of integration of e-services involving multiple

ministries and government agencies, and the debatable values to citizens of some of the services provided by the said government and ministries, exposes the gap and the level of Ghana's e-government have reached.

Furthermore, whilst more studies on e-government are necessary, the progress in the development of integrating e-services, for that matter, e-government, has been technological barriers or human capacity problems and levels of ICT usage in the country. The main users of these e-government services, i.e. the citizenry, businesses, government agencies, etc. have been denied with these services because of the incapability of the ministries and government agencies to provide websites and other platforms for their citizens. Ghana e-government projects has reached a point where its development, with further progress towards international best practices in e-government services delivery hinge on the willingness of key stakeholders to move towards connecting or networking e-government services: i.e. delivering of e-government services towards close cross-agency collaboration and data sharing among ministries and government agencies (Schware and Deane, 2003).

According to Boujarwah (2006) e-government inceptions in Ghana is probably one of the first such studies in the field. However, relying mainly on content analysis, he assesses the state of web-enabled G2C communication across government agencies, and concludes that as of 2006 few of ministry's and government agencies' websites had moved beyond the provision of basic information; that is, beyond the stage of 'one-way interaction'. It is at this point that Boujarwah concluded that there are number of hurdles and difficulties needed to be overcome to facilitate more broadly the adoption of e-government services for Ghana citizens/residents.

1.6 The Usability Engineering (UE)

It is imperative to know what usability engineering is and why it is important to adopt it in this study. The Usability Engineering is the method of setting quantifiable usability specifications, assessing interface usability, performing cost benefit analysis and making decisions regarding iterative enhancement to an interface of a service such as the e-gov (Bennett et al., 1984; Carroll & Rosson, 1985; Good, Spine, Whiteside & George, 1986; Whiteside, Bennett & Holtzblatt, 1988). Some researchers are of the view that, UE is a cost-effective, user-centred practice that ensures a high level of effectiveness, efficiency, and safety in complex interactive systems, being it virtual or simulated (Hix and Hartson, 1993). Actions in this process include user analysis, user task analysis, conceptual and detailed user interface design, quantifiable usability metrics, rapid prototyping, and numerous kinds of user-centered evaluations of the user interface.

According to Kruger et al. (1995), there have been a lot of virtual interactive systems, due to the desirability and innovation of technologies to create an enabling environment for government to serve their citizens better. The whole idea is to enable users (citizens) to interact with government in a more friendly, less expensive and convenient way. The introduction of the virtual interactive system is an introduction of technology which promises cost-effectiveness, user-centeredness process that ensures a high level of effectiveness, efficiency, and safety in multifaceted interactive systems (Hix and Hartson, 1993).

In the development of interactive systems, some activities in this process need to be carefully considered. These include user analysis, user task analysis, conceptual and detailed user interface (UI) design, quantifiable usability metrics, speedy prototyping, and various kinds of user-centered assessments of the user interface.

Usability engineering yields highly usable user interfaces that are essential to reduced manning, reduced human error, and increased productivity. Unfortunately, business executives and developers both in the corporate world and government sector, often have the misconception that usability engineering activities add costs to a product's and services development life cycle. In actual sense, usability engineering reduces costs over the life of the product and services, by decreasing the need to add missed functionality later in the development cycle, when such additions are more expensive. However, the use of usability engineering is an integral part of e-government implementation to enable citizens interacts with the interactive applications or systems, just as are systems engineering and software engineering. In addition, usability engineering activities can be tailored to suite and allow individualizing as needed for a specific transaction between government, citizens, and/or stakeholders.

Usability Design of a website

With the introduction of the Internet, there has been an outburst in Web-based interfaces and in the amount of Internet users. The impact of the Internet on the daily transactions of citizens and any other organizations is enormous and so resilient with the introduction of web-based interfaces. However, the significance of the usability of web-based interfaces is now more important than ever. Web-based designers should be able to

design a Website that provides meaningful and useful content, and also a satisfying experience for the user in tasks such as finding information, viewing images, playing demos, reading and understanding text and downloading information which will fascinate and attract the user to frequently visit the site again (Lee, 2000).

The term usability is not a one-dimensional thing of a user interface. It has numerous components associated efficiency, effectiveness and satisfaction. To elaborate on these components: efficiency of use: the websites should be efficiently used so that once the user has learned how to explore the web pages; a high level of productivity is possible. In terms of satisfaction: the websites should be pleasant to use, so that users are individually satisfied when using it.

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However, as discussed in the above paragraphs, on the part of designing a website, the introduction of ICT into businesses, commercial activities, private or personal transactions has made it possible for the use of internet and its related disciplines. The interaction between human and ICT enable system analysts and developers to design, evaluate, and implement interactive websites for human use. This interaction between human and ICT is an interdisciplinary field and throughout the last few decades, it has been influenced by research in fields such as ergonomics, social sciences, cognitive science, computer science, and the arts and humanities (Lee, 2000). These influences may inform government agencies as well as government ministries to allow computer analysts, website developers, programmers, just to mention few, on how to design websites for government agencies and ministries for users, in this case, the citizens, to be able to use these websites.

Knowing the users

It is important for designers to know who are going to use the websites. This is important because, the individual users/citizens are the main beneficiaries of the government websites. However, there are two main factors that impact on usability. These are: individual user characteristics and variability in task to be performed by the users (Straub, Loch & Hill, 2001).

Individual user characteristics: This includes work experience, educational level, age, previous computer experience (basic, intermediary and expect), reading and language skills, amount of time users will have available for learning, work environment and social context.

Variability in task to be performed by the users: It is difficult for website developers to know exactly how users would like to perform their tasks on websites that they would want to visit. The users' overall goals should be studied as well as how they currently approach the task, what their information needs are, and how they deal with exceptional circumstances or emergencies, especially on health issues and so on. It is therefore prudent for the website analyst and developer to perceive its *effective* users and user *strategies* and "*workarounds*" as clues of what a website could support.

1.7 General Factors Influencing Web Usability

According to Nielsen (1993), prior to the widespread use of the web, there are five key features one has to look at when designing websites: Consistency of the interface, Responses time, Mapping and metaphors, Interaction styles and Multimedia and audio-visual.

Giving attention to what Nielsen is saying, consistency element suggests the need for common placement of navigational tools, such as buttons and bars. Response time focuses on the speed with the website provided a response to user activity. Mapping and metaphors in usability emphasises navigation from one place to the other within the website and the acceptance of specific metaphors, such as downloading multiple information or electronic forms simultaneously. Interaction styles focuses on the website messages that are produced in response to user transaction. The last but not the least usability element is the degree to which multimedia capabilities are fused into the website design.

Nielsen (2002) extended the principle to design website to include: navigation, time, response, credibility and content. Navigation suggests easy-to-use, frequently updating, least download times, high quality content that takes advantage of capabilities unique to the online medium (Nielsen, 1993). Navigation is an important design element that allows users to obtain more of the information they are looking for and making the information stress-free to find. In this way, a key task in developing a website is to create worthy links and navigation mechanisms (Radosevich, 1997). Other areas to look at are the graphical design layout and actual content of a website. These are key components in making the web page easier to use (Rasmussen, 1996). According to Spool (1997) text links are necessary; navigation and content are inseparable; and key areas are navigation structure, searching, readability, and graphics.

Researchers should study more in usability engineering to enhance the use of websites by users. A website high in usability should produce a desirable perception of the use and an intention to use websites. Usability includes

the ease-of-use in getting the website to do what the user intends it to do, clarity of interaction, ease of reading and copying of document, if necessary, arrangement of information, the speed and the layout. When all these are available it will encourage high usability. This is because, it makes it easy for the user to use, efficient to use, makes enjoyable for the user and visually pleasing.

1.8 Importance of web usability in e-government websites

In e-government the websites is the government's interface with the citizens, and its usability is crucial to the success of the government's objectives to reach its citizens. Among the services that government's websites provide includes; communication, interacting with citizens, corporate entities, and other stakeholders. One of the significance issues for government agencies or ministries is to be able to understand, measure, and track the different factors that influence the effectiveness and efficiency of their websites.

A good user experience is the one achieves its goals and is highly satisfied with process and procedures; it will encourage reuse and recommendation of the websites. If the government is not focused in providing a good user experience (i.e. citizens interacting with government websites), then the website designers and developers of the government will be unable to build an efficient and effective website. However, understanding the user experience is vital. Through research methods, e.g. usability testing or engineering could be a powerful technique in achieving governmental change needed to develop effective and efficient websites (Burton & Taylor, 2004).

1.9 Research methodology

This study adopted the quantitative and qualitative methods, however was quantitatively bias because of the nature of the research which is survey, hence the use of questionnaire as the main instrument consisting of mostly close-ended questions. The study deployed both methods to overcome the limitation of each approach. A qualitative study was used to generate an in-depth understanding of complex issues of the human factor issues with the e-government services. More so, the quantitative method was used to determine the extent to which adoption and use of e-government services among the middle age population in the state of Ghana.

The population of the study was made up of the entire the middle age population in Ghana. The participation for this survey was entirely voluntary and anonymous. The participants could choose not to participate without any adverse consequences. The respondents were selected from all diverse sphere of life. In addition, the researcher looked at the population of Ghana, where those who have used the ministries and government's websites one way or the other to access information constituted the population of the study. For reasons of efficiency and easy access, the capital city (Accra) was chosen for the data collection where government head offices of Ghana were located.

Accra was chosen as the study area because of the central role it plays in the socio-economic and political development of the country. Accra is the administrative, communications, and economic center of the country. Because of this special role, the capital city turns to have all demographic elements of the country that were very necessary for the outcomes of the study. For instance, all social group of the country, in terms of tribes, religions, beliefs, etc., can be found in the capital city in almost equal proportions. The capital city also has all required elements of the chosen fields for the study in terms of job ranks and classifications, educational levels among others. Because of the demands of the capital city as the center of government and other economic activities, Accra has the participants or respondents of diverse abilities. Participants or respondents in the Ghana City therefore became the obvious choice for the study.

The the middle age population in the State of Ghana was chosen as the case study for improving usability of existing and future government virtual interactive systems design. A population sample of one hundred and fifty (150) was considered for the study. This means that each respondent or participant was chosen with a purpose because the researcher believed that, the participants had ideas on the kind of questions for the study. It was in this regard that the researcher chose a purposive sampling because of the usefulness for situations where one needs to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. The advantage of using non-probability sampling is it saves time and cost.

The purposive sampling technique was adopted for this study. In this study, the researcher selected 105 staff of the ministries, departments and agencies (MDA's). Sullivan (2001) has appreciated that quantitative data analysis involves the use of statistical methods to assemble, classify, analyze and summarize the data to derive meaning. In this study, data collected from the questionnaire was analyzed using Statistical Package for Social Science (SPSS) and with significance level of 5%.The SPSS as an analytical tool was used to create tables, chi-squares and correlation of some variables.

However, the questionnaire was structured in five sections and these are as follows;

i. Personal or BIO data of the respondents
ii. E-government programmes in Ghana
iii. Barriers/Problems/ Risks /Challenges
iv. Evaluation of Usability of E-government Programmes or services
v. The Use of ICT (Internet, email, etc.) by the citizen to access information

1.10 DATA ANALYSIS AND DISCUSSIONS

Bio-data

From the data collected, it could be seen that 51.4% of respondents were aged between 26-30. This was followed by 26.1% representing 31-35 years. In view of this fact, it could be deduced from the analyzed data that a higher proportion of the respondents were between the ages of 26-30.

The age distribution as illustrated in Table 4.5 is very significant statistically in explaining the age structure of overall population of Ghana. It reinforces the assertion that the population is disproportionately dominated by an active labour force age group (25-55years) (Antwi, 2010).

E-government programmes in Ghana

In this section, the researcher looked at the e-government issues with regards to the e-government programmes in Ghana to its citizenry.

4.3.2 Degree of awareness of the E-Government services

The knowledge on the awareness of E-Government services was also explored. This is shown in Table 4.1

Table 4.1: Awareness of E-Government services

Degree of Awareness of E-Government services	No.	%
Very aware	27	26.1
Aware	64	61.5
Not aware	11	10.4
Not aware at all	3	2.0
Total	105	100.0

Source: Field data, June 2013.

The majority of the respondents (61.5%) from the Ghana indicated “aware” while 26.1% indicated “very aware”, for extent of awareness of E-Government services in Ghana. This indicates that citizens of Ghana were aware of E-Government services. The explicit examples of E-Government services provided in Ghana include; electronic registration forms for business, online payment systems and provision of information on various governmental agencies’ websites.

The question on whether e-government programmes were enhancing the administration and management of Ghana, there were positive responses. The respondents affirmed that the existence of e-government programmes or services has increased significantly over the past years. The reasons given to support their affirmation were,

‘the government is able to reach a wider population with the implementation of e-government services, availability of public services and information all day long, elimination of time wasting, eradication of red-tape in the procedures in assisting citizenry with public information, ability to contribute in public decision making and accountability of public office holders. Furthermore, the response on whether the government is ready and interested in e-government services or programmes, was also positive as all of the respondents agreed that their government is ready and interested in e-government services or programmes. There was also a consensus e-government programmes or services has increased significantly in last decade’.

The advantages of e-government programmes or services identified are numerous.

Table 4.2: Advantages of e-government programmes

Responses	No.	%
Easy availability and accessibility of public information	50	47.6
Accountability	12	11.4
Improved ways of administration	20	19.1
Enhanced the speed in processing applications	12	11.4
Reduction of cost in running the affairs of the state	11	10.5
Total	105	100.0

Source: Field data, June 2013.

Majority of the respondents 50 (47.6%) indicated that the existence of e-government programmes in a country has the potential benefit of providing Easy availability and accessibility of public information. The results suggest that many citizens could access information which ordinarily would not be accessible. Other benefits identified by the respondents included improving the ways of administering and managing the government's agendas or policies (19.1%) and enhances the speed in processing applications (11.4%).

The finding in the study was consistent with the studies of Colesca and Liliana (2009), Mofleh, & Wanous (2008) and Lee & Lei (2007). For instance, Colesca and Liliana (2009) argued that the adoption and use of e-government services are diverse and long lasting in most countries. Among them include corruption is lessened, transparency is increased, government services to the population is delivered better, interactions with the business community and industry is highly improved, greater convenience, citizenry empowerment through access to public information, revenue increases' and finally more efficient government management. However, the success of these efforts depends, to a great extent; on how well the targeted users for such services, citizens in general, make use of them. While e-government serves to present a single face for all types of visitors, service needs differ among government's many customers.

Level of participation

As Ghanaian citizenry, to what extent do you agree or disagree to the statements below. Kindly tick the appropriate. *Very Low (1), Low (2), Neutral (3), High (4) and Very High (5)*

Table 4.3: Level of participation of e-Government services

Statement	N	High	Low	Total
E-Payment Transactions	105	65 (61.9%)	40 (38.1%)	105 (100%)
E-Democracy (e-voting, e-governance, …)	105	34 (32.2%)	71 (67.6%)	105 (100%)
E-commerce (B2B, B2C, G2G, G2B, G2C, G2E …)	105	70 (66.7%)	35 (34.3%)	105 (100%)
E-community	105	90 (85.7%)	15 (14.2%)	105 (100%)
E-Administration	105	65 (61.9%)	40 (38.1%)	105 (100%)
E-learning/education	105	90 (85.7%)	15 (14.2%)	105 (100%)

Table 4.3 above shows the level of participation with the e-government programmes in Ghana. Most (61.9%) staff from the government ministries and agencies revealed that there was quite a higher participation of E-Payment Transactions services in Ghana; however, (38.1%) disagreed to this assertion. Regarding e-Democracy, the respondents (67.6%) identified a low participation of those services as opposed to a staff size of (32.2%). A higher numbers of the participants (66.7%) in this study disclosed thatE-Commerce (B2B, B2C, G2G, G2B, G2C, G2E …) in Ghana was highly participated in. Lastly, respondents (85.7%) were of the view that e-learning/education was highly patronized by the citizens of Ghana.

The reasons for the low participation of e-government services became necessary. Table 4.4 below illuminates the results obtained.

Table 4.4: Possible reasons for the low participation of e-government services

Responses	No.	%
Usability or system interface problem	27	25.7
Less privacy	10	9.5
Inadequate network and document security	12	11.4
Legal issues	5	4.8
Technology Staff (IT staff support)	5	4.8
Infrastructural challenges	17	16.2
Irrelevant and inaccessibility of information	15	14.3
Digital Divide	14	13.3
Poor Quality of Service Delivery	15	14.3
Total	105	100.0

Source: Field data, June 2013

It is obvious from the above that, most of the respondents confirmed that inadequate usability features or system interface problem was the cause for the low participation in the e-government service in Ghana. Other reasons include infrastructural challenges -16.2%','Irrelevant and inaccessibility of information- 14.3% and many others. The result indicates that usability features or system interface problem was a major hindrance for low participation in e-government services in Ghana.
To support the above findings, Crede and Mansell (1998) argued that IT is known to be very powerful a tool to address some of the key barriers and challenges for entering the global economy and for future growth potential. ICT has the capability of transforming old challenges and creating unprecedented possibilities for sustainable economic development, just as it has achieved for the business community.

Besides, it is imperative that challenges such as usability or system interface, network and document security, Irrelevant and inaccessibility of information among others to be addressed by the government, decision makers and policy makers.

The Table 4.5 was to ascertain the reasons for high participation of e-government services in Ghana.

Table 4.5: High participation of e-government services

Responses	No.	%
Improved usability or system interface	40	38.1
Enhanced network, privacy and security	15	14.3
Technology Staff (IT staff support)	15	14.3
Availability of Infrastructure	17	16.2
Adequate and accessible information	18	17.1
Total	105	100.0

Source: Field data, June 2013

A glance at the results shows that (38.1%) responded that an improved usability or system interface was a major reason for the adoption and usage of e-government service. The conclusion is that majority of the middle age population in the state of Ghana would have used and adopted quickly when human factor issues are considered by designers of e-government services.

Usability Evaluation of E-Government Services (Websites)

To what extent do you agree or disagree to the statements below? Kindly tick the appropriate. ***Strongly Disagree (1), Disagree (2), Neither Agree nor Disagree (3), Agree (4) and Strongly Agree (5)***

Table 4.6: **Usability Evaluation of E-Government Services**

Evaluation criterion	Mean	SD	p
I find the website presented in an attractive way ***(Attractiveness).***	4.187	0.713	0. 580
I can learn a lot from this website ***(Attractiveness).***	4.528	1.417	0. 002 **
Going from one part of the site to another is easy on this website ***(Control).***	4.432	0.8748	0.04**
I feel in control when I am using this website ***(Control).***	3.657	0.860	0.160
I can find what I want on this website right away ***(Efficiency).***	3.655	1.221	0.009**
This website works exactly as how I would expect it to ***(Efficiency).***	3.098	0.691	0.219
This website is not designed to satisfy my needs ***(Helpfulness).***	3.725	0.945	0.012 **
All the parts of this website are clearly labeled ***(Helpfulness).***	4.459	0.820	0.005**
All materials written in a way that is easy to understand ***(Learnability).***	4.095	1.006	0.160
It will be easy to forget how to use this website ***(Learnability).***	3.153	0.779	0.005**
The degree to which the system protects me against making errors is high (***User error protection***).	4.520	0.879	0.061
Usability and safety for users with specified disabilities is provided by the website (***Accessibility)***.	4.899	0.745	0.660

Source: Field data, June 2013

The results in Table 4.6, shows that amidst perception on technological tools/facilities, what the middle age population perceived as highly insignificant usability feature was the 'Usability and safety for users with specified disabilities is provided by the website (***Accessibility***)' with highest Mean (M) of 4.528 and followed by 'The degree to which the system protects me against making errors is high (User error protection) with 4.520.

The respondents had very similar responses for motivators to using the e-government websites, namely 'All the parts of this website are clearly labeled', 'This website is not designed to satisfy my needs', 'Going from one part of the site to another is easy on this website' and 'I can find what I want on this website right away' were observed to be significant.

Upon further scrutiny in the table above, the factors such as Control, Helpfulness and Attractiveness concerns were found to have great influence on use in e-government services or websites by the citizens of Ghana. Individuals want to be able in control in the confident belief that movement on the site will be easy to do. Thus, by providing users with this assurance is the key to demonstrating the system usability. This finding is important because it provides useful strategic implications for the implementation of e-government services in the future. To adopt e-Government processes, citizens must have the intention to "engage in e-Government", which encompasses the intentions to receive information, to provide information, and to request e-Government services. Without confidence in the e-government services, processes, procedures, and other aspects of government, the vision of fully electronic service delivery will remain a challenging target.

On the other hand, 'this website works exactly as how I would expect it to *(Efficiency*)' was regarded the lowest mean of 3.098. Users of the websites in Ghana appear to be concern with the level of efficiency of the existing e-government websites. Ease of movement and level of efficiency could be two key elements for the public ability to use the website.

According to Keil et al. (1995) usability is correlated with how useful a system is perceived to be. Based on the rationale that usefulness cannot be meaningfully separated from usability, Zhang and Walji (2011) described how they have expanded the ISO definition for usability, resulting in three dimensions for usability:

i. **Useful**: A system supports the work domain where the users accomplish the goals for their work, independent of how the system is implemented.
ii. **Usable**: The system is easy to learn, easy to use, and error-tolerant.

iii. **Satisfying**: Users of the system have a good subjective impression of how useful, usable, and likable the system is.

Usability Evaluation by Gender

Table 4.7:
Assessment of Human Factor Issues in the Adoption and Use of e-government services

GENDER OF RESPONDENTS	N	MEAN	STANDARD DEVIATION	t	Df	Sig
Male	65	2.3877	1.02673			
				1.252	92	0.012
Females	40	1.8500	1.05125			

Statistical significance at the 0.05 level

From the above table it is evident that the mean score of government staff with male status (M = 2.3877) was greater than that of those with female status (M = 1.8500) on their level of adoption and use of e-government services. This was therefore subjected to the independent t-test and table above shows that there was a significant difference between male and female staff in Ghana' [t (105) = 1.252, p = 0.012< *0.05*]. The findings did support that male Ghanaian citizens were more likely to adopt and use of e-government servicesthan their female counterparts.

Two demographic factors; *gender* and *system confidence* have a major influence on the adoption and use of e-Government services. The finding of Tarafdar et al. (2011) was not consistent with the findings in this study. According to Tarafdar et al. (2011) men are more adopted to using e-government websites than women. In general, men find websites easy to use than females. However, women tend prefer to use websites that are more user friendly. On the other hand, less professionals or staff in IT with experience in usable content of the system that is the system is easy to learn, easy to use and error-tolerant appear to use adopt the system.

The respondents were asked to state how they wished to endorse and promote the government websites in Ghana.

Table 4.8: Endorsement and promotion of government websites in Ghana

Responses	No.	%
Use of the websites	60	57.1
Sharing their experience with their friends, family members	25	23.0
Advocating for an improved interactive platform for users	20	19.1
Total	105	100.0

Source: Field data, June 2013.

From the data gathered, most (57.1%) of the respondents endorsed the government websites and admitted that they would like to promote the patronage by continuous use of the websites as long as the services they need were available. Other respondents (23.0%) claimed that they have been sharing their experience with their friends, family members and all other persons that they have come into contact with.

In response to the question 'do you prefer to do your transactions electronically or face to face, and if 'yes' or 'no', why', the respondents were very empathetic that they prefer to do business electronically with government rather walking to the ministries to that face-to-face. The reasons given were; it is cheaper, easier, friendly, convenient, fast and less time consuming. For that matter, the respondents were of the view that doing business with government electronically i.e. e-government is far better than transacting business on face-to-face basis.

In this study, the users of e-government services appear to have a mutual and collective agreement and satisfaction from the respondents that government's websites are necessary since the government manages their resources and also control affairs of the state they live in. There was a section of the respondents who were also of the view that government's websites are necessary because it makes life easier for them. Things are done

quicker at a cheaper rate as compared to the conventional methods where hard copies of documents were used in doing any business with the state institutions.

To evaluate the cost of browsing on the internet especially of government websites, the respondents were asked how much they spend in exploring theses websites, as compared to the conventional systems, i.e. (absence of government websites). There was a collective response that the amount of money they spend on these websites was not really or very expensive. It was also evidenced from the data gathered, a large number of respondents believed that the introduction of government websites will help minimize corruption in the system

Challenges of e-government programmes

The respondents identified the challenges associated with the implementation of e-government programmes or services in Ghana.

Table 4.9: Challenges of e-government programmes

Responses	No.	%
Incomplete synchronization of e-services with other government websites	14	13.3
Technological barriers or human capacity problems	38	36.2
Levels of ICT usage in Ghana	20	19.1
Inaccessibility of pertinent public information	15	14.3
Others (Low bandwidth, less frequency of updates…)	18	17.1
Total	105	100.0

Source: Field data, June 2013

The users (36.2%) of Ghana e-government programmes or services were of the view that the major challenge was technological barriers or human capacity problems. Secondly, Levels of ICT usage in Ghana (19.1%) and sometimes Low bandwidth and less frequency of updates were the challenges identified during the usage of e-government services. In conclusion, it appears that the respondents felt discouraged to explore the websites of the various government, ministries and other governmental agencies because of these enormous challenges.

In support of the above findings, Wangpipatwong, Chutimaskul and Papasratorn (2005) argued that the existence of such challenges gradually affects the citizenry (users) in having interest in the e-government programmes or services and this had been a great lost to many countries in Europe and even Africa.

The Use of ICT (Internet, email, etc.) by the citizen to access information

In this section, the researcher observed use of ICT by middle level population of the Ghana. This was to access to assess how the citizens use ICT and the internet for example email, to assess information. The paragraphs below delved vigorously into the use ICT and the internet to assess information.

Level of computer skills

The study found out the views of respondents on the level of computer skills ranging from novice to expert.

Table 4.10: Proficiency level of computer

Computer Skills	No.	%
Novice	2	1.9
Intermediate	76	72.4
Advance	25	23.8
Expert	2	1.9
Total	105	100.0
Novice (1.0904) Intermediate (1.1244) Advance (0.8565) Sig. (0.004)		

Source: Field data, June 2013

It could be observed from Table 4.10 that majority 76 (72.4%) of the respondents from the government ministries of Ghana specified that they were at the Intermediate level whilst 23.8% identified their proficiency level as advanced level. This implies that majority of government staff in Ghana were able to use the e-government services for accessing information and other work-related activities. The results revealed an insignificant number stating the position of being a novice with regards to computer knowledge.

The Post hoc Tamhane's T2 test revealed that significant differences existed between skill levels of Novice (beginner) and Intermediate as well as intermediate and Advance towards academics usage of ICT for academic research, learning and teaching.

Frequency of Internet usage

The subjects of the study responded to questions relating to the frequency of using Internet their workplaces. Majority of the users in Ghana59.0% stated the frequency of Internet usage as daily. However, it was intimated that other users (21.0%) from the middle class population of Ghana identified that Internet services was used on weekly basis. The results mean that most users accessed the Internet on daily basis. A study by Kiptalam, and Rodrigues (2011) supported the findings in this study. They found out that in a week more than 40.8% of citizens accessed the internet for 10 hours or more.

Wangpipatwong, Chutimaskul and Papasraton (2008) concur that the low or high usage of internet by the citizenry explains that users are already familiar with the Internet and thereby would be ready to use e-government services when introduced. The Internet is a part of their life now.

The researcher again assessed the subjects' views on the time span of completing a purchase on the website level of satisfaction and the result has been shown in the table below.

Table 4.12: Duration of completing a purchase on the website

Frequency of internet usage	No.	%
0 – 10 minutes	62	59.0
10 – 20 minutes	22	21.0
30 – 40 minutes	17	16.2
Above 40 minutes	4	3.8
Total	105	100.0

Source: Field data, June 2013

For the data gathered, it was established that most of the respondents used approximately between 10 – 20 minutes of time to complete a purchase an item on the website. This therefore suggests that the respondents used more time when completing a transaction on the internet. From the researcher point of view, this is discomforting to the users since many people may not like to waste precious time on the internet just to complete a transaction. Admittedly subjects of the study would wish to spend less time to complete a transaction on the internet.

The data collected from the respondents (70%) found that government websites, including www.ghana.gov.gh was difficult to use. The reasons associated with the difficulty;

i. Going from one part of the site is not easy on this website**.**
ii. No control when I am using these websites**.**
iii. This websites does not work exactly as how I would expect it to

However, 30% of the respondents were not sure if it was easy to navigate these websites. From the researcher's view it is very difficult for the respondents to navigate these websites. There may be unfamiliarity of using these websites.

Table 4.13:Use of ICT (internet, email, etc) to access information

Questionnaire Item	N	Agree	Disagree	Total
E-government service is very useful in accessing information	105	35 (33.3%)	70 (66.7%)	105 (100%)
Government's virtual interactive- system is logical to me	105	38 (36.1%)	67 (63.8%)	105 (100%)
The government's www.e.gov.kw is not too slow and time consuming	105	55 (52.4%)	50 (47.6%)	105 (100%)
I think e-government service is helpful to improve payment systems online.	105	34 (32.2%)	71 (67.6%)	105 (100%)
I can easily request e-forms, my statement etc. from (www.ghana.gov.gh) website without any assistant from anybody.	105	36 (34.3%)	69 (65.7%)	105 (100%)
The interfaces of www.ghana.gov.gh is horrible to me	105	90 (85.7%)	15 (14.2%)	105 (100%)
It is difficult to tell if this government's virtual interactive - system has what I need	105	65 (61.9%)	40 (38.1%)	105 (100%)
I think the websites are user friendly	105	35 (33.3%)	70 (66.7%)	105 (100%)
There is no demo to first time users of the websites	105	89 (84.8%)	16 (15.2%)	105 (100%)
I think that the cost of using the internet is expensive	105	85 (80.9%)	20 (19.0%)	105 (100%)
Governments' websites provide sufficient public information and services	105	78 (74.2%)	27 (25.7%)	105 (100%)

Source: Field data, June 2013

Most of the respondents 70 (66.7%) disagreed that the government's websites have much information that they need. Similarly, there were also strong disagreements by respondents (63.8%) that the government's virtual interactive-system is logical to them. This may be due to poor visual or display of information, pictures and the whole interface not appealing to the middle class population of Ghana. On the case of respond time of the government websites, most (52.4%) of the respondents fairly agreed or admitted averagely, that government's www.e.gov.kw is not too slow and time consuming.

However, on the view of whether respondents think that e-government service is helpful to improve payment systems online, there was an objection from most (67.6%) of the respondents. Majority (65.7%) of the users of e-government services claimed and admitted that they cannot easily request e-forms, statement etc. from (www.e.gov.kw) website without any assistant from anybody. In addition, most (85.7%) of the respondents admitted to fact that, interfaces of www.e.gov.kw is horrible and it was difficult to tell if this government's virtual interactive system has what they needed (61.9%).

Again, most (66.6%) of the respondents disagreed to the statement that 'I think the websites are user friendly'. However, there was a positive response from most of the respondents that introduction of government's virtual interactive systems has some benefits than it used to be. Majority (84.8%) of the respondents claimed that there is no demo to first time users of the websites. It was widely held that the cost of using the internet is expensive (80.9%) and these websites additionally do not provide sufficient public information and services. Most of the respondents agreed and admitted that, i.e. those who have ever used these websites of the government, they would recommend to others to use these websites of the government.

The overall impressions of the government websites were not very positive. Most of the respondents claimed that it is useful and convenient to use the government's website such as www.ghana.gov.gh amongst other. On the view of what features of the government's website do you think should be improved and why, the respondents listed some areas of the websites that must be considered and improved. These include, "*improvement of the interface of the websites, easy navigation including the first time users, there should be a demo for first time users, an interactive features which will enable users to reach public officers, prompt response to email and request from government through emails, calls and through an interactive feature on these websites, improvement on the websites where users can easy download and fill forms on the internet with little or no effort or help from anybody and available of e-government services 24/7.*

The researcher again assessed the subjects' views on level of satisfaction and the result has been shown in the table below.

It was observed from Table 4.13 that majority of the respondents (75.2%) from the state of Ghana were dissatisfied while a few (12.4%) of the middle class population from Ghana were satisfied with the current state of e-government services. From the result above, this implies that a greater number of academics were dissatisfied with the current usage e-government services.

Summary of findings

The major findings of the study, therefore, included:

i. From the data collected, most (61.9%) of subjects were males while 38.1% were females. About (28.2%) of the respondents indicated the length of service as ranging between 3-5 years. On the issue of age distribution, (51.4%) of respondents were aged between 26-30.

ii. Most (93.3%) respondents from the government institutions' were aware of the existence of E-Government' concept in Ghana. Majority (47.6%) indicated that the existence of e-government programmes in a country has the potential benefit of providing easy availability and accessibility of public information, the citizens could access information which ordinarily would not be accessible, improving the ways of administering and managing the government's agendas or policies and enhances the speed in processing applications.

iii. On the usability evaluation of e-government services (websites), 'going from one part of the site to another is easy on this website (control)' with highest Mean (M) of 4.528 and followed by 'the degree to which the system protects me against making errors is high (user error protection) with 4.520.

iv. Upon scrutiny, it was found out that the factors such as Control, Helpfulness and Attractiveness concerns had great influence on use in e-government services or websites by the citizens of Ghana. In this study, there was a significant difference between male and female staff in Ghana' [t (105) = 1.252, p = 0.012< *0.05*], thus males were more likely to adopt and use of e-government services than their female counterparts.

v. It was found that most staff from the government ministries and agencies revealed that the was quite a higher participation of E-Payment Transactions services (61.9%), E-Commerce (66.7%) E-learning/education (85.7%) in Ghana. About (38.1%) responded that an improved usability or system interface was a major reason for the wide adoption and usage of e-government service.

vi. Most (57.1%) subjects in the study underscored that, to endorse the government websites, they would like to promote the patronage by continuous use of the websites as long as the services they need were available. According to the middle age population (36.2%) of Ghana, e-government programmes or services faced challenge such as technological barriers or human capacity problems, low levels of ICT usage in Ghana (19.1%) and sometimes Low bandwidth and less frequency of updates.

vii. Upon the review of the e-government services, respondents (75.2%) of the middle class population from the state of Ghana were dissatisfied.

Conclusion

Despites the benefits of e-government implementation and the case of improving usability of existing and future government virtual interactive systems design, there are major problems, challenges and success factors in its implementation that were identified. These major problems, challenges and success factors in the implementation of e-government and using the usability engineering to improve the existing and future government websites that were identified in the previous section has established the fact that there are more to do to improve the system to take it to an improve level of tolerance.

Furthermore, introducing the concept of usability engineering and its importance in the design of e-government platforms is what the government of Ghana must do in order to improve or increase the usage of these websites. The importance of e-government service and the usability engineering of government websites have dramatically increased due to extremely fast growth in Internet technology in the country. The government websites design is directly related to the purpose of the website creation. It has been established that government websites with poor usability can easily reduce the interest to adopt and use the system. Usability engineering evaluation methods have been proposed in literature to identify usability problems of the government websites. It was established that there is no standard on classification of usability evaluation methods.

Recommendations

Based on the findings of the study, the following measures are recommended after an examination of the current state of e-government in Ghana. These lists of possible areas of improvement have been identified. In this section possible suggestions and recommendations will be discussed to improve e-government services and also to improve the usability of government's websites of Ghana. They are establishment of Public Authority for e-government projects, improvement of Payment system, e-government campaign, improvement of ease of use, enhance training of personnel, interactive interfaces and effectiveness of the system design.

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