Challenges and Prospects of Establishing e-government in Liberia

With focus on the Ministry of Finance, the Ministry of Commerce and the Ministry of Planning and Economic Affairs of the Republic of Liberia

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DEDICATION

It has taking more than a year since the inception of this thesis. The period has witnessed the roles played by several personalities who all cannot be listed in this dedication, including my wife Mariam J. Kamara, my beloved kids including Amadou Kamara, Sira Kamara, Aisha Kamara, Abrahim Kamara and Musa Kamara. They created for me the learning environment at home with their support. I appreciate their support and understanding.

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ABSTRACT
The use of ICT in government institutions of the Republic of Liberia has been around for decades though very few institutions implemented it most especially in the old fashion EDP-Electronic Data Processing systems where large departments were created for centralized data processing tasks. The old fashion EDP proved very costly, less effective, difficult to manage, which provides the incentive for establishing a more effective, user friendly, collaborative oriented systems in the form of Electronic government. Though in most other government institutions there is less usage or appreciation of the roles of ICT in government.

Liberia, just emerging from a long 14 years of civil crisis which destroyed its entire human and technical infrastructure, lags behind most of the African countries and the world at large in the wagon of implementing ICT and its related research.
With the continuous and ever important requirement for transparency and accountability in the public sector services, where ICT has been a tool to assist efficiency and accountability in the public sector, the government of Liberia has embarked on the implementation of ICT projects in governance, though there is limited research work so far done in use of ICT in governance in Liberia. There has been very little known research in ICT or e-government with specific focus on Liberia, with one limited research done by UN in 2010. However, there are records of research on E-government of developing countries including Kenya, Ghana and post war Rwanda, etc. There are lessons learnt from these research works that will be of good input for the Liberia case as per similarities in challenges and obstacles of implementing e-government developing countries.

This thesis research is in support of identifying obstacles, challenges, and benefits of transforming the public sector by introducing ICT. There are few known ICT projects in government including the Finance Ministry's IFMIS and ASYCUDA projects, the CSA Biometric systems which were evaluated, partly to ascertain government readiness for e-government. The investigation included some key government ministries.
The research results, achieved through using well established and internationally acknowledged research methodologies, identified the e-readiness level of the government of Liberia, with given challenges, obstacles and benefits. The findings of the research show that Liberia can successfully implement e-government if the identified obstacles are removed or minimized.
ABBREVIATIONS

ACS: America Colonization Society
ASYCUDA: Automated Systems for Custom Data
CBL: Central Bank of Liberia
CDA: County Development Agenda
CSA-Civil Service Association GSA: General Services Authority
DME: Expenditure and Debt Management
GAC: General Auditing Commission
GOL: Government of Liberia
IFMIS: Integrated Financial Management Systems
LAN: Local Area Network
LISGIS: Liberia Institute of Statistics and Geo-information services
MCC: Monrovia City Corporation
MOC: Ministry of Commerce
MOF: Ministry of Finance
MOT: Ministry of Planning and Economic Affairs
PMT: The Project Management Team
PRS: Poverty Reduction Strategy
PSC: Project Steering Committee
RL: Republic of Liberia
SES: Senior Executive Service
WAN: Wide Area Network
CHAPTER ONE

1.0 Introduction

ICT and e-Government are closely linked, the subject of this thesis. ICT is a broad terminology encompassing all that includes communication devices such as radio, television, satellite systems, cellular phones, computer equipment and accessories, network equipment and software etc. ICT is a useful tool that enables public agencies to change from routine-based, command-and-control organizations that are inwardly focused on administration to knowledge-based, networked, learning organizations that are externally focused on service (OECD 2005).

With the spread of democracy around the world, including African countries, the pressure on government by Citizens and partners of government to ensure transparency and accountability, including the pressure for efficient and effective functioning of government processes and procedures, has increased. This pressure has led to the desire and implementation of e-government projects by a number of governments around the world.

The role ICT plays in our life has become tremendous, especially during the last decades, resulting in what is referred to as the information age, digital age, or knowledge age. While this is true, Africa is lagging behind the developed countries with constraints such as economic, war, limited human resources, less willingness by political leaders etc. Despite these limitations, governments in Africa, like any part of the world, are under pressure to transform their business processes and procedures to automated means with the desire to achieve e-Government to ensure better service delivery at lower cost, greater transparency and accountability. In the last decades, the penetration of the Internet has increased drastically with various factors influencing Internet adoption by countries as considered in a number of studies. It was confirmed that telecommunication infrastructure (Hargittai, 1999), socio-economic factors (Robinson & Crenshaw, 1999) and cultural values have a significant influence on ICT adoption among countries. These are some of the reasons why the level of ICT penetration in each countries differs with gaps between developed and developing countries. While it is true that the use of ICT or computers in government is not new even in Africa, the concept of e-government and its implementation came after the Internet and the Dot.com and electronic commerce boom in the 1990s. E-government builds on e-business principles (Weerakkody et al., 2009). The Internet has been the gateway of businesses to reach far more customers with less regard to geographical locations than was previously possible. Thus businesses have been able to expand their profit margin with increasing number of customers from all over the globe. The rapid take-up of and confidence gained in E-commerce and the spread of the Internet has encouraged scholars to research the area of E-government.

E-government has multiple meanings and definitions developed by various scholars and practitioners. At the low level, e-government may refer to government web sites, which are mostly static in content, but as newer technologies came to the fore, the scope of the description of E-government has become broader, including more interactive technologies.

One common thread, through most definitions of e-government, indicates its ability to transform government and make it more responsive and accountable to citizens. (Voß & Sharda 2010). One factor that distinguishes e-business and e-commerce from e-government is that the former deals directly with customers for profit making objectives while e-government deals with the citizens, partners, or between government entities, with the objectives of transparency, accountability, efficiency and effectiveness in service delivery instead of profit making. The phrase Electronic government (e-government) refers to use of information and communication technology (ICT) to enhance the range and quality of public services to citizens and businesses while making government more efficient, accountable and transparent (Schware, 2005). It is truly a global phenomenon, with impacts on both developed and developing countries. The recent UN 2010 E-government E-readiness index only indicates two countries in Africa with no web presence-Somalia and Central African Republic (UN e-government e-readiness survey 2010). The concept of e-
government goes far beyond Web sites, many new and emerging technologies have appeared recently and are part of the e-government movement, such as Wireless and new social media technologies. E-government is defined as 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. (World Bank 2010) 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. E-government ensures that government's interaction is made better and more efficient not only with its citizens but within itself-intergovernmental agencies’ collaboration and coordination and with external partners such as businesses and donor agencies. The implementation of e-government will transform the mode of transactions or interaction between citizen and government, between government and businesses, government and partners such as donors. It eliminates of minimizes the physical interactions between the entities through using electronic and technological means. One major objective of e-government is to improve the activities of public sector organizations and their agents. (Heeks, 2008). The implementation of e-government assists in management of public finance, human resources, and service delivery. It provides access to and enhanced quality of public services, particularly for poor people (World Bank 2003), improves investment climates, including lowering regulatory burdens and business-to-government transaction costs and government transparency and accountability. E-government refers to 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 (World Bank, 2010).

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 timely information, or more efficient government management systems. E-government is the use of information and communication technologies (ICT) to improve the activities of public sector organizations and their agents. (Heeks, 2008).

E-government platform uses information and telecommunication technologies to help smooth the progress of the daily administration and functions of government and provide better services to its citizens, businesses, and other government agents or entities including partners. It is the source of empowerment for citizens, to allow them to actively participate in the democratic institutions and political processes of their country. Information is made available to citizens from government, two way means of communication is allowed where citizens provide their opinions in the government decision making process.

According to Ntiro, e-government has three focus domains as depicted in figure x (adapted from Ntiro (2000), eGovernment in Eastern Africa, KPMG, Dar-es-Salaam):

![Diagram](image)

**Figure x: Focal Domains for eGovernment Initiatives (courtesy: Ntiro, S. (2000))**

Improving government processes: **eAdministration**, Connecting citizens: **eCitizens and eServices** and Building external interactions: **eSociety** (Ntiro, S. (2000)).

**e-Administration**
This domain is concerned with the improvement of the internal processes of the public sector, which
may include cost reduction associated with internal processes and better management of process performance (Ntiro, 2000). e-Administration creates an effective management of the coordination and control of business processes and the electronic information they create. Its main objectives are: to increase the efficiency of internal administrative processes within various government institutions and to lessen the administrative burden faced by all staff during this process, which leads to full transformation of internal coordination and interaction between different departments and sections of the public sector with the aid of technology. This ensures speedy and timely delivery of results, and thus less costly processes.

**eCitizens and eServices**

These are the aspects of E-government that concern the relationship and interaction between the government and its citizens, just as E-business has customers, the government considers its citizens customers, though not for profit making objectives as with e-commerce. The objective of these initiatives is to ensure improved service delivery with the citizens’ satisfaction in mind (Ntiro, 2000). Not only does this provide citizens’ satisfaction but it also increases confidence and trust between government and its citizens. Tax payment, online form filling, driver and passport applications are all carried out by citizens using the platforms built for eCitizens and eServices. Both Janssen and Lambrinoudaki et al. identify a lot of common components automating internal processes, providing citizens with better services, etc.

**Building External Interactions: eSociety**

These are initiatives that explain the interaction between the government entities and its partners including private sector companies, non-profit and profit organizations, world bodies like the World Bank, IMF, and United Nations etc. They may include improved working relationship with businesses (Ntiro, 2000). Within the eSociety, businesses may pay taxes online, register businesses online, carry out two way communication using technology with no or very little need for physical interaction. This helps ensures efficiency and effectiveness.

In recognizing the benefits of improved efficiency in delivering government services through electronic medium, e-government initiatives have increased rapidly in the last decade (Weerakkody, Choudrie, & Ghine, 2004). The benefits of E-government implementations include but are not limited to; less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions in the public sector. E-government has assisted citizens’ tax filing, management and processing of identification papers such as passport, acquisition and renewal of ID Cards, Driver Licenses etc. all performed electronically. The nature of government service delivery has thus been facing rapid transformation in recent years (Heeks & Bailura, 2007; Mosse & Whitley, 2009), and contributed to the development of new service industries; better delivery of services; and faster, cheaper communication. (Devadoss, Pan & Huang, 2002).

E-government also provides a platform for online government job applications, and obtaining of birth and marriage certificates. In the more mature E-government systems, citizens are allowed to interact with government electronically in many fashions, including casting their votes. In the traditional governance systems, in the absence of E-government systems, these services would have required physical presence at various government entities, with time and other resources less effectively and efficiently utilized. Liberia like most developing countries is new to E-government, where very little is heard about E-Government in public.

The thesis indicates that the recent investment in the fiber broadband connection for Liberia is a challenging investment of around 25 million dollars (GOL 2010). At the current date, there is only one known ICT related degree program in the country which is carried out in partnership with University of Liberia and an Indian University with very limited student intake because of surrounding challenges of conducting distance education in Liberia. The absence of ICT educational facility leads to prospective Liberian ICT professionals leaving the country for Ghana, Nigeria and other countries including India for ICT education, inhibiting the increase in the number of qualified ICT professionals in Liberia. On the basis of these challenges, the research is inclined to analyze the
existing ICT infrastructure in three major government ministries- the Ministry of Finance, the Ministry of Commerce and the Ministry of Planning and Economic Affairs. The author's assumption is that findings associated with these ministries will give some insights and understanding of the overall government position towards e-government readiness, thus indicating how ready the country is for electronic government.

The 2010 UN E-Government readiness index identified that 190 of the 192 member countries are making some sort of effort towards Electronic governing systems. The survey is conducted annually by UNPAN. According to the UN 2010 E-readiness survey, there are only two countries in Africa without web presence (Central African Republic and Somalia). As we learn from chapters to come, each country is ranked from 1 to 190, showing different levels of position towards readiness for E-Government.

1.1 Aims and Objectives of the Study

With very limited knowledge of research on e-government specifically for Liberia, this thesis will help improve the understanding of challenges and possibilities of implementing e-Government in Liberia, There has been research done on e-government in developing countries especially by (Heeks, 2008), who is renowned for his research on the subject. While we agreed that there is little information on research on Liberia in this domain, the other research that is associated with developing countries will be a good input for the study on Liberia. There are numerous factors of importance that establish the significance of this study including the fact that policy makers in Liberia are most likely unaware of the concept and principle of e-government and its possible impacts. In fact very little is known by the policy makers and budget designers on ICT, depicted by budget papers (GOL 2010). We will provide guidelines in the form of recommendations as part of the objectives.

*Overall Research question 1:* Identifying what are the obstacles for implementation of e-Government in developing countries.

The present thesis will answer the following questions:
- Sub RQ 1: What is the level of readiness of Liberia for E-government implementation?
- Sub RQ 2: What roles can ICT play in the development agenda of Liberia in the PRS?
- Sub RQ 3: What are the existing ICT infrastructures and technical human resource capacity?
- Sub RQ 4: Is there any ICT policy and if so, how widespread is it implemented?
- Sub RQ 5: What is the level of resistance that might exist for e-government implementation?

1.2 Statements of the research problem

The principle and fundamental idea behind the research is to identify „Challenges and Prospects of establishing E-Government at the Ministries of Finance, Commerce and of Planning and Economic Affairs“. According to the UN 2010 E-readiness index, Liberia is amongst the 190 countries that are making efforts towards E-government. The present thesis focuses the identification of the level of readiness of the three mentioned ministries.

The research question will uncover the status of the Ministries of Finance, Commerce and Planning and Economic Affairs „en-route“ to the state of E-government. The gap will be identified and recommendation made for the stakeholders. The researcher has no knowledge of similar research been done with this objective in the most recent history of the country. There are no known records on research work in the area of ICT within government, this has help motivate the researcher as the virgin nature of the work required to allows the researcher greater level of creativity and skills. There is also the opportunity looming of government interest in the work as there is awareness now that the government of Liberia is in a preparation stage of national ICT policy for both public and private institutions.
1.3 Organization of the Thesis
The thesis is divided into five chapters, from chapter one to chapter five. **Chapter one** gives a narrow perspective and hypothesis in the form of research problem of what is really a complicated and broader problem specifically associated with the study areas, the three key ministries.

**Chapter two** includes the conceptual framework and literature review which provides an opportunity to the reader an in-depth review of different opinions of E-government concepts and models by other researchers and commentators. Based on the literature review a frame of reference is presented where the theoretical framework is choosing to aid the process of data collection.

**Chapter three** presents the different thoughts of methodologies and the choosing methodology of the study which provides the guidance for

**Chapter four** presents the data collected, the analysis and results generated from the analysis of the collected data.

Finally **Chapter five** presents Summary, Conclusion, recommendations and limitation of the thesis. The research findings are informed by the various theories and methodologies of E-government.

1.4 The Studied Areas
The areas of the research are the three key government ministries in Liberia. Liberia, a country on the West Coast of Africa situated within borders with Guinea, Ivory Coast, Sierra Leone and the Atlantic Ocean. A country founded for free slaves from America by the American Colonization society, so called ACS after the abolition of slave trade in the Americas brought the free slaves to the soil of Liberia in 1822. The state of Liberia was actually created 1847, July 26, when the declaration of independent was signed. Liberia has population of approximately 3.5 million (LISGIS 2008).

The country went through a protracted civil war from 1989 to 2003, with a relatively brief interlude in the late 1990s. Peace was finally restored in 2003, with the signing of the Comprehensive Peace Agreement (CPA) and is now bolstered with the assistance of 15,000 UN peacekeepers. The civil war had a devastating impact on the economy and social welfare. The economy contracted by more than two thirds in real terms since 1980. GDP per capita, in current prices, was only $190 in 2006 and $246.91 in 2010, according to World Bank (World Bank 2010). Much of the country's physical and productive infrastructure (e.g. electricity generation and transmission, large parts of the water supply facilities, most of the capital stock of the mining industry) has been destroyed. There are signs of improvement in the economy since the first democratic election 2005 helped by the restoration of peace and security and boosted by demand from the donor activities in the country, with growth of 7.8% in since 2006 (World Bank 2006), with increasing percentage each year. Due to the long civil war, the capacity of the public sector to deliver basic public services had deteriorated remarkably, as a result of a collapse in government revenues, loss of human resources and a breakdown of systems of government. Many experienced and qualified staff left the public service and the country during the civil crisis. This trend has changed drastically with a democratically elected government.

Government salaries had shrunk to extremely low levels (salaries for civil servants range from $30 to $55 per month before the first democratic election in 2006, and are gradually has improved to the lowest earning $100 per month (GOL 2011). Delivery of key public services by Government has improved, but was poor. Many basic services were currently supplied by NGOs, until 2010, with concentration on providing emergency relief in humanitarian emergencies, however this position of the INGOs have changed with transfer responsibilities to the GOL. In addition, Liberia is rich in natural resources (agricultural land, forests and mineral deposits) but the Government’s capacity to protect and manage these natural resources and ensure that they are utilized optimally for the benefit of the population is very weak.
Liberia is divided into 15 counties each headed by the representative of the president called the Superintendent. The county is further divided into districts, clans, chiefdoms etc. The counties of Liberia are Bomi, Bong, Gbarpolu, Grand Bassa, Grand Cape mount, Grand Gede, Grand Kru, Lofa, Margibi, Maryland, Montserrado, Nimba, River Cess, River Gee, and Sinoe.

The government of Liberia has three functioning branches, mirroring the USA system of check and balance between government entities, namely the Executive, Judiciary and the Legislative. The arrangement of the government in this fashion supports the idea of checks and balances and avoids misuse of power. The government of Liberia has the following ministries which are part of the executive branch.

- Ministry of Finance
- Ministry of Planning and Economic Affairs
- Ministry of Commerce
- Ministry of state and Presidential Affairs
- Ministry of Education
- Ministry of Post and Telecommunication
- Ministry of Labour
- Ministry of Justice
- Ministry of state and Presidential Affairs
- Ministry of Agriculture

1.5 The Ministry of Finance

The Ministry of Finance was created by an Act of National Legislature, Republic of Liberia, with an authority to manage, direct and coordinate the financial affairs of the Country. It is mandated to collect revenue; engages in loan arrangement, disburse government funds, and service the National Debt. The Ministry is headed by the Minister with three Deputy Minister for Revenue, Deputy Minister for Expenditure and Deputy Minister for Administration. Each department is headed by a Deputy Minister. The ministry has the following department: Revenue Department, Administration Department and Expenditure Department

1.5a Revenue Department

The revenue department is responsible for the revenue collection for the government of Liberia in the forms of taxes. With the implementation of e-government, the revenue department will be one of the most hit departments because of its possible transformation and tax collection methods preferably done online/automated system ensuring not transparency in tax collection but efficiency. The revenue department, through the use of ICT in establishing a webpage will provide an opportunity to see the effective delivery of public goods and services to citizens accompanied by quick government response with minimal direct intervention of a public official (MOF, 2011).

1.5b Administration Department

The Administration Department of the MOF is responsible for the day to day running of the ministry. Charge with responsibility to ensure the day to day running of the ministry which includes recruitment, training and retention of staff including permanent and contractual staff. With the proper implementation of ICT, the department can be transformed with the use of database related application for human resource management. The duplication of personnel listing will be avoided and the effective performance management systems can be put in place.
1.5c Expenditure Department

The Expenditure Department which also includes Debt Management is the department at MOF responsible for all payments of government’s expenditure incurred to business partners. This is one of the departments that will benefit immensely with the full establishing ICT and e-government. At present, it host the Integrated Financial Management System (IFMIS), which is a computerized application systems recently implemented at the MOF is to transform Public Financial management through the use of and implementation of technology.

IFMIS is a multipurpose Information management system with the objective of ensuring Efficiency, transparency and accountability serve as hallmarks of the system. This is a budget management and accounting system to ensure that financial resources are use more efficiently and effectively. It consists of, Public Financial Management, Treasury Management, Public Expenditure management, Receipts management, Civil Service Management, Performance Management. IFMIS aims to provide a means of check and balance for the government and its partners. On-line applications for the capturing of debts of all forms of category ensure rapid process and avoid unnecessary delays (MOF, 2011).

1.6 Existing computerized systems at the MOF

The Ministry of Finance as part of its restructuring process and enhancing better financial management systems is instituting several new computerized systems. This section briefly discusses two of the most notable ones including ASYCUDA and IFMIS. The objective is to analyze the relationships that exist between the various applications, their functions and the possible interoperability within the framework of E-government. The details provided here were learnt from documents read about the projects and interviews conducted with staff members that are associated with these projects.

1.6a ASYCUDA- Automated System for Customs Data

A project initiated by the Revenue section of the Ministry of finance-ASYCUDA: Automated Systems for Custom Data is one of the computerized applications been implemented at the Ministry of Finance, actually an internationally acclaimed custom’s automated systems used by many other countries. The system automate the processes of collection of data, detects frauds, and makes the clearing of good easy for business institutions and individuals involved with clearing goods at the ports of entries in the country. The projected was initiated by the department of revenues at the Ministry of Finance.

ASYCUDA is software developed by UNCTAD. It was introduced to Liberia in November 2009. It is a computerized customs management system which covers most foreign trade procedures. The system handles manifests and customs declarations, accounting procedures, and transit and suspense procedures and generates trade data that can be used for statistical and economic analysis. Liberia Customs is implementing the version of ASYCUDA called ASYCUDAWorld which is built on a Java platform, allowing the systems to work on any operating platform and most relational database systems, which greater security level embedded. ASYCUDAWorld takes into account the international codes and standards developed by ISO (International Organization for Standardization), WCO (World Customs Organization) and the United Nations. The systems is built to allow for modification for national characteristics such as national tariff and legislation

FEATURES OF ASYCUDAWorld

- Full Automated clearance process; System available 24/7
- Manifests will be electronically transferred to ASYCUDAWorld.
- Direct Trader Input of customs declarations (entries) from the importers/exporters/brokers premises.
- Self-Assessment of duty and taxes.
- Efficient Payment Schemes available such as online payment to banks and pre-payment facilities.
• Simplified Single Administrative Document (SAD) can be printed directly by the ASYCUDAWorld system.
• The use of the Customs Release Order to trigger completion of transaction, release of cargo and automatic write-off of manifests.
• Risk Assessment and Selectivity Functions to help Customs to facilitate compliant traders while focusing on high risk shipments.
• Transit cargo movement between Customs offices will be simplified by automatic tracking of shipments and subsequent automatic reconciliation of documents.
• Increased Accounting and statistical capabilities.
• Post Clearance Audit.

The system can provide inter-agency linkages with relevant government departments such as Ministries of Finance, with banks for online payments, brokers and importers for direct trader input, carriers and international customs organizations providing a truly e-government capability. It is projected that at the end of the project ASYCUDAWorld will be in full operation at all Customs locations across the country. At least 90 % (GOL 2010) of the clearance processes will be done through the system. Customs Procedures will be clearly defined and documented and Customs officers will be properly trained in the use of ASYCUDAWorld.

1.6b IFMIS-Integrated Financial Management Systems

IFMIS-Integrated Financial Management Systems (IFMIS) is one computerised application systems recently implemented at the Ministry of Finance. IFMIS underlining objective is to Transform Public Financial Management through the use of Information Communication Technology. The major objective of the system is to ensure Efficiency, Transparency and Accountability in the public financial management systems. IFMIS ensures timely, more accurate reports, better decision making, and ease of consolidated of information. It improves Public Expenditure Management processes; enhances greater accountability and transparency across Ministries and Agencies. The GOL IFMIS solution is the latest version of the FreeBalance Accountability suite comprising the following modules; Performance Management, Public Financial Management, Treasury Management, Public Expenditure Management, Receipts Management and Civil Service Management. As part of the IFMIS implementation in the Ministry of Finance, there is fully functioning LAN, staff members of the Ministry of Finance are expected to be trained before the systems goes live. One objective of this system, by means of IFMIS implementation, is to link the Civil Service Agency (CSA) to the personnel units in various ministries for the processing of civil servant payrolls. The aim of this is to avoid the duplication of civil servants names, prevent fraud, and to provide checks and balances to ensure greater accountability and transparency in government. IFMIS implementation creates a single database for human resources for each government institution, which will be inter-linked to provide better service.

The IFMIS Implementation Management

The IFMIS management structures comprise the Project Steering Committee (PSC) and the Project Management Team. The PSC is chaired by the Deputy Minister for Expenditure and Debt Management (DME). It oversees IFMIS the implementation according to the project plan. The Committee membership comprises representatives from Government, the IFMIS Project Manager, Users and the Supplier(s). CSA, GSA, CBL, and GAC are all represented on the PSC.

The Project Management Team (PMT) is chaired by the Assistant Minister for Expenditure and Debt Management (AME). The Chair-PMT is responsible for coordinating the IFMIS implementation. The PMT members include Comptroller & Accountant General, Deputy Comptroller Generals, the Director General of Debt Management, Project Manager, PFM Reform staff, Change Management Advisors, Functional and ICT Specialists together with their government counterparts, and heads of workgroups. The workgroups are; Training and Change Management, Audit and Security, ICT, Application Implementation, Budget Implementation, Human Resource Payroll Implementation and Procurement and Contract Management. CSA, GSA,
and GAC are members of the PMT. There is an IFMIS Project Office headed by the IFMIS Project Manager responsible for the day-to-day IFMIS implementation activities. The project office is staffed with a team of competent professionals.

One of the biggest challenges for an IFMIS system especially in a post conflict environment is HR capacity and the ability of Government to retain qualified and trained staff. This challenge is being tackled in a systemic way in Liberia. Given the weak HR capacity, technological improvements in the area of public financial management are being matched with corresponding increase in HR capacity. A Financial Management Training Unit supported by the World Bank was established in 2006. This Unit has trained over 200 MOF accountants in basic accounting and computer skills through short-term courses. Apart from the current pool of civil servants, a special group of fresh graduates are recruited through a competitive examination process. These graduates are undergoing a specially designed MBA Program within the MOF that focuses on accounting, public financial management and information technology. The training unit has a well equipped computer lab with more than 30 computers. The training is designed to ensure that a core group of IT specialists is available to for periodic training in the field of ICT skills. As the IFMIS project goes online, the group of recruits would have undergone 16 months of IT training. These trainees have signed a 4 year bond to work in Government after the completion of their two year training. Since the first batch, there have several recruits for the same training to ensure sustainability.

Apart from training the staff to mitigate the risks of under utilization there would be a need to disseminate general awareness of the functionality of the package. There are challenges associated with basic infrastructure issues, viz. remote connectivity and reliable power supply that can not only cause damage to the hardware but also result in downtime in operations. The IFMIS project thus would have to provide for reliable generators, circuit breakers and UPSs etc. (as well detailed in the IFMIS project documents)

1.6c ATAS

In addition to ASYCUDA, the MOF also has another application called ATAS which provide a better platform for tax payers. ATAS is an automated tax administration system (ATAS) has been installed which takes five minutes to process transaction. The Bank Payment Slip Section (BPSS) is the unit responsible for the Verification of tax payers. In the process, tax payers are responsible to take their bills to this unit to be access and afterward process through this automated tax administration system which takes five minutes and after that it is printed and sign by BPS Clerk for upward transmission to the Central Bank Tellers (CBT) who then print out the treasury receipts and deliver to the taxpayers (Augustus, 2011).

1.7 The Ministry of Commerce

The Ministry of Commerce and Industry was established by an Act of Legislature in 1987. The Ministry was originally established in 1948 as the Department of Agriculture and Commerce. On June 1, 1962 it became the Department of Commerce and Industry. On December 31, 1971 the name was changed to Ministry of Commerce, Industry and Transportation. An Act detaching the Bureau of Transport from the Ministry of Commerce, Trade and Transportation, resulted in the current Ministry of Commerce and Industry.

1.7a Roles and Functions

The main functions of the ministry of Commerce created by an Act of the legislature include the establish and regulate commodity and trade standards, the collection, evaluation and publishing of data pertaining to Commerce and Industry sector. The ministry also is to ensure the establishment and enforce standards for business practices, promote sound development of foreign and domestic trades, issues Import and Export Permits for businesses in the country, control quality of goods and commodity imported into and exported from the Country, implement efficient and effective trade management system including pre-shipment inspection of imports and exports and monitoring and
regulating prices of essential goods.

1.7b Structure of the Ministry
The Ministry has three distinct bureaus:
- Bureau of Administration
- Bureau of Commerce & Trade and
- Bureau of Industry
The three bureaus are subdivided into 13 Divisions and they are: Personnel, Finance, Electronic Data Processing, Information, and Planning & Research, Foreign Trade, Domestic Trade, Inspectorate, Price Analysis & Marketing, Standards, Small-Medium Enterprises (SMEs), Industrial Development, Industrial Administration & Supervision.

1.7c Computerized systems at the ministry of commerce
Our investigation confirmed that there are no automated systems in the Ministry of Commerce, though there are desktops and laptops been used by staff members in the ministry. There are estimated 50 computers in the ministry none fully networked. The ministry however has a web site; our data shows that the web site is not fully up to date.

1.8 The Ministry of Planning and Economic Affairs
The ministry of planning been created by act of legislature is responsible of design and development of the economic direction of the country.

1.8a Background of the Ministry of Planning and Economic Affairs
The Ministry of Planning & Economic Affairs (MPEA) is one of the newest cabinet-level departments in the Liberian government. Originally established by Legislative Act on February 14, 1976, as the Ministry of Planning & Economic Affairs (Chapter 32; Executive Law), the defined role of the new Ministry was to undertake economic studies for planning and economic policy to foster, promote, and develop the Liberian economy.

1.8b Functions of the Ministry Planning and Economic Affairs
The legislative mandates, couple with some of the works performed by the MPEA, and suggest that the Ministry's operational/functional mandate can be characterized as listed below:
- Initiating and coordinating the development of policies, plan and programs for the economic, financial, social, cultural and physical development of Liberia.
- Undertaking research on national development issues.
- Providing technical and research support to the Cabinet.
- Undertaking consultant activities for local and foreign government entities.
- Managing external cooperation agreements and programs.
- Collaborating with external funding agencies in the identification and implementation of development projects that support Liberia's Poverty Reduction Strategy.
- Maintaining a national socio-economic library.
- Advises the Government on major issues relating to economic and social policy.
- Interprets decisions on economic and social policy and integrate them into the national development program.
- Prepares economic models for the guidance of policymakers, investors and other planners.
- Assesses existing and projected social, economic and manpower resources and formulate plans for the most effective use of such resources.
- Coordinates national, regional and sectoral development planning of facilitate the consistent and efficient implementation of projects and programs.
• Determines the economic, financial and technical feasibility of new development projects, and coordinate the implementation of on-going projects.
• Be instrumental in conceptualizing investment projects for national development.
• Collects, compiles, analyses and monitors social status and economic performance data.
• Prepares population projections.

The Ministry has the following departments:
• Administration
• Economic Affairs and policy
• Regional and Sectoral Planning

1.8c The Administration Department’s functions and roles
The Department of Administration plans, organizes, directs and controls all activities concerning human resources, finance and logistics in support of the mandated functions of the Ministry of Planning and Economic Affairs, directs selections, recruitment, appointment, training and development, promotion, transfer, discipline and termination of employees in accordance with the Civil Service Agency regulations. The Department also manages the budgeted allotments of the ministry in accordance with the budget law. It also provides support and back up to all different organs of the ministry through performing tasks and activities regarding legal, financial and administrative affairs which include financing and financial resources, cost monitoring, accounting procedures follow up, providing financial consultations, providing different logistic and administrative requirements, in addition to supervising ministry's incoming and outgoing mail supervision.

1.8d Department of Economic Affairs & Policy
The Department of Economic Affairs & Policy derives its mandate from the Executive Law that created the Ministry of Planning & Economics Affairs (MPEA) and also from the three-year Strategic Plan of the Ministry. These core functions herein referred to as service lines include the following:
• Undertake economic studies for planning and economic policy
• Prepare long-range and intermediate-range economic development plans
• Analyze the interrelationship and internal consistency of various proposed programs and projects
• Review progress made on all programs and projects which have been adopted, and report findings and recommendations to the Executive Committee of the National Planning Council
• Undertake all staff activities incidental to the National Planning Council deliberations
• Review, coordinate the process and record all external aid and assistance programs (in consultation with the Ministry of Finance)
• Report on progress of these (external aid) on the (national development) programs
• Recruit and train additional staff: economics, mathematics and computer science
• Establish National Economic Growth and Poverty observatory laboratory
• Develop and implement baseline and performance management framework within the National Civil Service Reform Strategy
• Develop a socioeconomic analysis framework and indicators
• Track PRS deliverables for accurate reporting
• Develop an M&E framework to evaluate PRS, CDA, and NGO activities and implementations
• Produce quarterly economic reports (in conjunction with LISGIS)
• Strengthen relationships with civil society, donors and agencies in coordinating the implementation of development programs and projects.
• Develop a long-term growth strategy for Liberia.
• Foster harmonization and alignment of partner activities
• Implement revised NGO Policy
• Reinvigorate ECOWAS Unit
• Monitor the MCC Threshold to Compact implementation of Liberia in partnership with USAID.
• Promote the harmonization and convergence of sub-regional economies.
• Form strategic partnership on economic and growth strategy with World Bank.
• Facilitate the establishment of national ICT for development committee
• Providing guidance and leadership in the development of a policy around the use of ICT for Development (ICT4D) in conjunction with the Ministry of Post & Telecommunication.

1.8e Regional and Sectoral Planning

Department of Sectoral and Regional Planning is composed of two Bureaux, supervised by two Assistant Ministers. The Department of Sectoral and Regional Planning is responsible for planning, organizing, directing, and coordinating the compilation and analysis of data on demographic, economic, legal, political, cultural, sociological, physical and other factors affecting regional and County Units. The Deputy Minister for the Department of Sectoral and Regional Planning, proposes sectoral and regional policies, directs the formulation of plans, programmes and projects based on approved policies; directs the provision of advice to line ministries and local administration on the preparation of sectoral and regional plans. The Bureau of sectoral Planning interacts with line ministries of Government, specifically providing guidance to the line ministries in the preparation of sector plans in accordance with government priorities ranks and directs the consolidation of selected sector projects into national plan.

The Sectoral Planning Bureau is composed of the following divisions:

• Social Services Sector Planning Division;
• Infrastructure Planning Division;
• Productive Sector Planning Division;
• State-Owned Enterprise Planning Division.

The Bureau of Regional Planning plays a critical role in the area of national reconstruction and development. The Bureau ensures that there is balanced, equitable development in Liberia that all regions in Liberia benefit from development projects. – The Assistant Minister for Regional Planning Bureau spurs reconstruction and development at the regional level and provides assistance to local governments, including cities, counties, municipalities and districts with issues related to comprehensive planning, zoning and sub-division regulations, land use planning, hazard mitigation program, environmental planning, community development, etc. The Ministry of Planning’s operational manual outlines the hierarchical arrangement of the department as well as the various sectors of the Liberian economy including the marine resources (fishery), the extractive industry (mining, forestry and oil), social services sector (health & social welfare, education, water and sanitation etc.), productive sector, infrastructure sector, state-owned enterprise sector, environment, rural and urban sectors. The Department deals also with thematic and cross-cutting issues of HIV/AIDS, Malaria, Gender and Development (Gender based violence, sexual exploitation and abuse, female genital mutilation, rape etc.).

1.8f Computerized systems at the ministry of Planning and Economic Affairs

Our investigation confirms that the ministry of Planning and Economic Affairs is making extensive use of ICT. The ministry has employed a staff recording systems where staff by biometric means records their entrance and exit from the office. The ministry has it LAN where there are nearly 50 computers connected but no domain oriented network was observed.
The ministry has a web site which is fairly up to date in content as per our investigations through random observation
CHAPTER TWO- THEORY

2.0 The Principles of government and e-governance

Chapter two brings into fore the principles of government and governance from various perspectives including the types and history of government. The research will not be considered complete if electronic government is discussed without providing an understanding of what government is or how government works as a wider scope. Government had existed as far back as mankind, what have changed have been the different kinds of governing systems over the centuries or decades.

In its broadest sense, it refers to a body that has the authority to make and the power to enforce laws within a civil, corporate, religious, academic, and other organization (Dimitrova & Chen, 2006). Riley (2003) refers to -government as a superstructure that deals with decisions, rules, implementation, and outputs of its policies; whereas -governance refers to functioning based on processes, goals, performance, coordination, and outcomes. Government is established institution in order to provide safety and protection for its citizens and residence within the territorial limit of the state, nation or country. It ensures protection of the land from foreign and internal enemies; it sets rules and laws by which everyone lives by considered the constitution of the country. Responsible Government ensures the prevention of tyranny and withstands accountability and transparency to its people. The absence of government would encourage the weaker been oppressed by the stronger thus government helps to prevent greed and oppression against people. As part of it functions, government protects natural rights such as right to life, liberty, healthcare, property etc. These are rights that should be enjoyed by all. The provision of social order, security, public services, and economic systems for the citizens and residence in fair and transparent manners are all expectations of citizens and residence associated with governments. There are varying definitions of government, from the perspective of democracy, dictatorship, autocracy etc. According to the American legal definition of government; Government is a system of social control which grants a particular group of society the right to make laws, and the right to enforce them.

There are many classifications of government, distinguished by whether power is held by one man, a few, or a majority, or on the basis of institutional organization and the degree of control exercised over the society

2.1 Types of Government

Government is described in several different forms depending on the ways of governance. For the purpose of this thesis, we will discuss and give category of government in the following forms:

- Democracy
- Monarchy
- Aristocracy
- Dictatorship
- Democratic Republic

2.1a Democracy

The term comes from the Greek word δημοκρατία (dēmokratía) "rule of the people", which was coined from δῆμος (dēmos) "people" and κράτος (kratos) "power" (Wikipedia). Democracy is defined as a Government of the people, by the people, for the people (Abraham Lincoln, 1863). From Abraham Lincoln's point of view, the entire processes of a democratic governance in driven by its citizens which include national decision making, policy making, the rights of all to be equal etc. He coined the term during his fight against slavery.

Democracy is an egalitarian form of government in which all the citizens of a nation together determine national policy, the laws and the actions of their state, requiring that all citizens (meeting
certain qualifications such as age, mental status etc.) have an equal opportunity to express their opinion. In practice, "democracy" is the extent to which a given system approximates this ideal, and a given political system is referred to as "a democracy" if it allows a certain approximation to ideal democracy. Although no country has ever granted all its citizens (i.e. including minors) the vote, most countries today hold regular elections based on egalitarian principles, at least in theory. While there is general agreement of the good nature of democracy, it is also believed that there are limitations. Take the for instance the quote from the former British Prime Minister Winston Churchill _"No one pretends that democracy is perfect or all-wise. Indeed, it has been said that democracy is the worst form of government except all those other forms that have been tried from time to time"_(Sir Winston Churchill 1874-1965). This well-known quote focuses right on the weak spot of democracy: There is no such thing as the "perfect form of government" on earth, but any other form of government produces even less desirable results than democracy. Until today, no other form of government has been invented that could regulate public affairs better than democracy. (Sir Winston Churchill 1874-1965). The trend of governance in the world now is going democratic, more and more countries are democratic than a decade ago especially in sub Saharan Africa which greater demand in the Middle East (UN 2011). The democratic mode of government is the trend, according UNDP, Democracy is the trend in governance systems around the world since the collapse of socialism in Eastern Europe and the military authoritarianism in South America in 1980s. For instance, in 1985, 67 out of 124 countries (54.1%) had an authoritarian government, 44 (35.5%) a democratic one and 13 (10.5%) a mixed form of government, while in 2000, 26 out of 147 countries (17.7%) had an authoritarian government, 82 (55.8%) a democratic one, and 39 (26.6%) a mixed form of government (UNDP, 2002:15)

2.1b Monarchy form of government

The term _monarch_ is a Latin word- _monarcha_ comes from the Greek _monàrches, μονάρχης_ (from _mònos, μόνος_, "one/singular," and _archoν, ἀρχων_, "leader/ruler/chief") which referred to a single, at least nominally absolute ruler. In current usage the word _monarchy_ generally refers to a traditional system of hereditary rule, as elective monarchies are rare in the modern period. (Wikipedia). Monarchy is a form of government in which all political power is absolutely or nominally lodged with an individual or individuals (Wikipedia). There are various ways to define Monarchy; such as form of government the head of the monarchy is the monarch who is considered the head of state, who considers the rest of the citizenry as subjects. The Monarch position is gained by hereditary with fewer styles allowing election. This is a form of government that was common in the ancient and medieval periods. One example of monarchy is the constitutional monarchy which is practiced in the United Kingdom and Thailand headed by the Queen or king.

2.1c Aristocracy form of government

The term Aristocracy came from the Greek word _aristo_, which means excellent, and _kratos_, which means power, is a form of government in which a few of the most prominent citizens rule the nation. _Aristokratía_ (Greek) also means "rule of the best".

The concept evolved in Ancient Greece where by a council of prominent citizens was commonly used and contrasted with _Monarchy_, in which an individual king held the power. In later years, aristocracies primarily consisted of an Elite Aristocratics class privileged by birth and wealth.

2.1d Dictatorship form of government

A dictatorship is defined as an autocratic form of government in which the government is ruled by an individual mostly with no regard for popular rule of law. Dictatorship can be viewed from three perspectives:

- A Roman Dictator was a political office of the Roman Republic. Roman dictators were allocated absolute power during times of emergency. Their power was originally neither
arbitrary nor unaccountable, being subject to law and requiring retrospective justification. There were no such dictatorships after the beginning of the 2nd century BC, and later dictators such as Sulla and the Roman Emperors exercised power much more personally and arbitrarily.

- A government controlled by one person or a small group of people. In this form of government the power rests with one person. Such power is often obtained forcibly. A dictator usually takes away much of people's freedom.
- In contemporary usage, dictatorship refers to an autocratic form of absolute rule by leadership unrestricted by law, constitutions, or other social and political factors within the state. Among the most extreme examples of dictatorship in recent history and modern times are Nazi Germany and North Korea. In the twentieth century and early twenty-first century, hereditary dictatorship remained a relatively common phenomenon.

2.1e The Governing system of Liberia

The governing system is democracy, though a country independent since 1847, Liberia has been either under a one party system or a military dictatorship until most recent in 2006 when Liberia had its first international accepted elections to form the first democratic government sworn in. There have been two successful democratic elections since 2006 giving way for sustenance of democracy. The democratic nature of the country of Liberia makes a suitable candidate for the implementation of e-government which requires transparency and accountability.

The government of Liberia has three functioning branches, mirroring the USA system of check and balance between government entities, namely the Executive, Judiciary and the Legislative. The arrangement of the government in this fashion supports the idea of checks and balances and avoids misuse of power.

2.2 The Concept and History of Electronic Government

Information and communications technologies (ICTs) create possibilities and benefits for governments around the world. They are used to improve the quality of services, to reduce costs, and make policies and programs more effective (Gil-Garcia & Helbig, 2006; Lim & Tang, 2008; Roy, 2007). Information and communication technologies are used as a catalyst for organizational change. ICT is also considered a tool to improve democratic participation in political and civil organizations, thus most democratic governments are now using e-government in their governance process. The terms digital government and e-government have emerged over the last 15 years to refer to the use of ICT in government, and its meaning has been evolving over time (Gil-Garcia & Luna-Reyes, 2006; Yildiz, 2007). Conceptualizations of electronic government are diverse (Brown & Brudney, 2004; Edmiston, 2003; Roy, 2003; West, 2004). The more restrictive views of e-government only consider the use of the Internet to provide public services, while others consider any use of ICT in government. Digital government research is a very young area of inquiry. As such, there is not yet an agreement in terms of a leading methodological approach. International research efforts in this field are also quite new, and also show a breadth of research methods and traditions. This is as the results of less research done in related areas such as public administration. The trend however is changing with the annual review done by UN.

The term Electronic Government is also referred to as E-Gov, Digital Government, Online Government, Connected Government, and Transformational Government, which is the process of creating a comfortable, transparent, cheap interaction between government and its citizens (G2C-Government to citizens), government and business enterprise (G2B-government to business enterprise) and relationship government (G2G-Interagency relationship).

Governments around the world are embarking on the implementation of e-government in order to achieve greater transparency, efficient and effective government. The science of e-government falls between government, society, and ICT, making it multi field related studies. There are several known characteristics of such as:
• Using information and communication technologies,
• Supporting government actions,
• Improving the relationships between government and citizens, and
• Following a strategy to create public value

(Gil-Garcia & Luna-Reyes, 2006).

Some other conceptualizations of digital government also involve the creation of a legal framework and a strategy to promote ICT adoption and the knowledge society. There have already been several attempts made to comprehensively describe the term e-government in a single statement, this has proven difficult. While this is true, a common understanding of the term has been agreed, which is that e-government refers to the use of information and communication technologies (ICTs), particularly Web-based applications, to provide faster, cheaper, easier, and more efficient access to and delivery of information/services to the public, businesses, other agencies (non-profit), and governmental entities (Biancucci et al., 2001; Dearstyne, 2001; Palvia & Sharma, 2007). We can also say digital government is defined as –the selection, implementation, and use of information and communication technologies in government to provide public services, improve managerial effectiveness and promote democratic values and mechanisms; as well as the development of a regulatory framework that facilitates information-intensive initiatives and fosters the knowledge society (Gil-Garcia & Luna-Reyes, 2006, p. 639). E-Government is –The use of ICTs, and particularly the Internet, as a tool to achieve better government [OECD, 2003, p 23]. The e-Gov efforts by the European Union are based on the definition: –eGovernment is the use of Information and Communication Technologies in public administrations combined with organisational change and new skills in order to improve public services and democratic processes [EU, 2004].
E-Government enables the continuous optimization of service delivery, constituency participation and governance by transforming internal and external relationships through the use of ICT, the Internet and new media associated with ICT.

E-government started early 1990s after the boon of the Internet and the success stories associated with E-Commerce and E-Business around the world. Though the principle objectives of E-commerce and E-government may differ, E-commerce’s is higher profit, greater competitive advantage, while E-government has more to do with greater citizen participation in the governance process, higher citizen satisfaction, transparency and accountability. They all seek to ensure effectiveness and efficiency; however the customer based is different. E-commerce seeks to make profit for the company by ensuring continuous customer satisfaction while E-government seeks to provide greater citizen confidence and participation in decision making processes. E-government has its roots from multidiscipline theories and models which include Public Administration, ICT, Organisational Discipline, Human Resource etc. The multidiscipline nature of the field of E-government makes it more complicated to implement and manage successfully. The successful implementations of E-government platforms will require the full work of various different professionals and better organization and coordination. The implementation will require an entire redesign of the organisational processes and procedures of the governance structure and system. According to UNDP, Information and communication technologies (ICTs) provide developing nations with an unprecedented opportunity to meet vital development goals such as poverty alleviation, basic health care improvement and universal education more effectively than ever before, via the appropriate utilization of technological tools. However, the full potential of E-government application and others ICTs remain to be fully harnessed by developing countries; this is also true for developed countries that have greater level of technological infrastructure in place including telecommunication and enhanced educational levels of citizens. There is increasing evidence that E-government, if implemented strategically, can improve efficiency, accountability and transparency of government processes. E-government has been reportedly instrumental in bringing transparency to public dealing (Cho & Byung-Dae, 2004), which in turn increases public confidence in government by its citizens and partners.
2.3 Comparative analysis of E-government implementations- selected countries

For the last decade, we have seen a revolution in the provision of E-government services by most governments around the world for their citizens. The underlining condition may be different, for instance developed countries such as USA, Canada and most EU countries have far advanced ICT Infrastructure and educated citizenry while developing countries are struggling to develop and deploy the basic ICT infrastructure with less educated citizenry or low literate rate. Notwithstanding, very few countries are harnessing to the fullness e-government implementation. The trend however in the last ten years shows that e-government gap between countries between countries in closing in. With support from many sources including the UN E-government readiness report, ITU as depicted in appendix (d), E-government implementation documents from various countries, this section of the analyses using comparative analysis of E-government implementations in selected countries. In order to get a fair and comprehensive view of the implementations of E-government, the researcher has selected four countries deliberately for analysis including USA, United Kingdom, Kenya and Cape Verde. The researcher hopes that the finding associated with these countries will be of great help in the implementation of the Liberia E-government project. Descriptive information for each country comes from government Websites, government documents, newspapers, other Internet sites etc.

2.4 e-government implementation Experience-Kenya

This section discusses the Kenya e-government implementation experience since 2004 when it started the journey, with brief description of the country. Kenya lies across the equator in east- central Africa, on the coast of the Indian Ocean. Kenya borders Somalia to the east, Ethiopia to the north, Tanzania to the south, Uganda to the west, and Sudan to the northwest. Kenya became a British protectorate in 1890 and later a colony in 1920. At the time, it was known as British East Africa and was declared independent in 1963.

2.4a Kenya e-government Journey

The Kenya e-government journey started in 2004 when the government created the e-government program and strategy. Within the strategy were the objectives of ensuring the -process for the modernization of Government, as a means toward: enhancement of transparency, accountability and good governance. A working team called the Directorate of e-government was set up to drive the journey with the goals:

- e-government is to make the government more result-oriented, efficient and citizen- centered.
- e-government is to enable citizens to access government services and information as efficiently and as effectively as possible through the use of Internet and other channels of service delivery and communication (GOK, 2004)

The government of Kenya defines e-governance as the use of ICTs to transform government processes and the provision of services, just as defined by the World Bank, a major donor of e-government in Kenya. Considering the above benefits, the government of Kenya developed the objectives of the e-government strategy:

- Improve collaboration between government agencies through reduction in the duplication of efforts, and enhance efficiency and effectiveness of resource utilization;
- Improve Kenya’s competitiveness by providing timely information and delivery of government services;
- Reduce transaction cost for the government, citizens, and the private sector through the provision of products and services electronically;
- Provide a forum for citizens ‘participation in Government activities (GOK, 2004).

2.4b Kenya-Infrastructure, Penetration and Connectivity

As of July 2009, Kenya had a population of 39,002,772, with only 22%of this making up the urban population (CIA, 2009). The number of Internet hosts (a computer directly connected to the
internet through a modem via a telephone in e, cable, or satellite was 7,376 (Ibid.), the number of Internet users was 3,359,600 only 8.6% of the population (Miniwatts Marketing Group, 2009). The number of active telephone lines was 252,300 in while the number of active mobile cellular phones was 16.234 million (CIA, 2009). However, there has been no recent growth in fixed-line infrastructure (Ibid.) largely because the state-owned Telkom Kenya, previously the Kenya Posts and Telecommunications Corporation (KP&TC), bred fraud, corruption and indolence (Arunga &Kahora, 2007) controlling this for their exclusive benefit. Nevertheless, it is observed that the number mobile cellular subscribers are growing at an exponential rate: 15,000 in 1999, largely due to the easy access, especially for citizens in the rural parts of the country. With only 8.6% of the Kenyan population being Internet users, Internet penetration remains a significant challenge to the implementation of e-governance strategies. E-governance expenditures and efforts are being directed to a small number of citizens as Internet users represent only a small portion of the population. At the moment East Africa constitutes less than 1% of the world’s Internet usage (World Bank, n. d.). This was due to the fact that it was the only major in habited coast line without an undersea fiber-optic cable. As a result, the region was forced to rely on expensive and often unreliable satellite links (Rice, 2009). Besides slow speeds, Internet costs have been the main barrier to connectivity. Basic internet costs typically range from Ksh.7,000 to Ksh.15,000 ($100–$214) per month. Such costs are significantly high when compared to a per capita GDP of under $900 per year (CIA, 2009). In spite of these challenges, Kenya ranks number seven among Africa’s top ten Internet countries (UN, 2009), an underground submarine cable known as -SEACOM was laid to link South Africa, Tanzania, Kenya, Uganda, and Mozambique with London, Marseille, and Mumbai. Furthermore, two separate cables one known as -TEAMS under the ownership of the Kenyan government and the other known as -EASSY funded by the World Bank already in place called SEACOM. Similar to many developing countries, Kenya set grandiose but unrealistic goals with its e-governance strategy.

E-government initiatives have been largely limited to the establishment of government websites which in many cases have been rudimentary at best, carrying very limited information and value for the citizens (Mwaura, 2008). Initially, the government failed to plan for the infrastructure requirements. Nevertheless, the government’s funding of its own cable (TEAMS) in 2009 is a significant effort in the implementation of its e-governance strategy. More cables will certainly mean more access, as Internet costs are forecasted to drop by as much as 80%. With increased Internet usage, more citizens will be able to take advantage of myriad e-government initiatives.

2.4c Lesson Learnt-Kenya

The government of Kenya requires continuing aiming its e-government strategy at a larger sector of the population as opposed to the lower number of the population predominantly in urban areas. Currently, the major reforms have targeted Internet users who make up only 8.6% of the population. In order to expand the successes of e-government initiatives, it should be aimed at other forms of ICTs like television, radio, and particularly mobile cellular phones, and not be limited to the Internet as the success of M-PESA has shown. The government needs to expand efforts in growing the penetration of the Internet by providing Internet kiosks with multi-lingual capabilities that citizens in rural regions could use to access government services. As Arlikatti et al. (2010) contend, such efforts are effective in not only bringing the services to often forgotten poor rural citizens, but in educating and promoting trust-building between the government and citizens. The challenges facing effective transparency through e-governance are contributed in part by a lack of access to government information. In Kenya, legislation like the -Official Secrets ‘Act offers protection to public official’s . Under this and similar acts, Government transactions continue to remain deliberately opaque, making it impossible for citizens to use this information to hold officials accountable. This need to change and the public should gain accessibility to information on how its government is operating, especially regarding decisions on awarding government contracts to various agencies. Despite the policy to establish governance, the classification system under the Act has made it impossible for the public to have open access to information necessary to solve their day-to-day problems. This detracts from the goals of the e-
government initiatives, which were to provide the efficient access to information, and services for the public, promote productivity among government officials and most importantly to encourage e-participation of the public in government thus empowering citizens and promoting democracy. Thus strong commitments from leaders to revisit the stipulations of the –Official Secrets ‘Act are important for e-governance to be successful. E-governance should not be mistaken for transparency but should instead be viewed as a tool to promote transparency (Arlakatti et al., 2010).

2.5 E-government implementation Experience-Cape Verde

Cape Verde is a nation of ten windswept, arid islands, 280 miles (450 km) off the western coast of Sub-Saharan Africa. Cape Verde became part of the Portuguese Crown in 1462. Cape Verde acquired its independence from Portugal in 1975, and then adopted a socialist dictatorship until 1991, when it switched to a multi-party, parliamentary democracy with free elections (Wikipedia).

2.5a Cape Verde e-government Journey

The researcher is motivated by the fact that Cape Verde been one of the success stories in the E-government wagon in the West African region, realizing the first place in West Africa of the UN 2010 E-government readiness index followed by Ghana. The Western Africa region is the lowest ranking region in the 2010 Survey, showing virtually no improvement since the 2008 Survey (UN 2010). According to the UN, this is due the existence of poor telecommunications infrastructure and low human capacity in the region. Cape Verde as part of its quest for E-government made it a national priority to include the implementation of E-government process as one its most important required deliverables. There was an establishment of the Information Society Strategic Program which defines electronic government as one of the pillars of the development of the Information Society in Cape Verde. Cape Verde created its Electronic Government Action Plan (EGAP) which defines the strategic guidelines for the Electronic government, by establishing, in a pragmatic and objective way, the axes of action, projects and actions, as well as the respective timeframes for completion, with a view to combine efforts and resources to address all identified priorities. The Electronic Government Action Plan fits into the information Society Strategic Program (ISSP), and constitutes the major tool for the strategic planning and operational execution of the information society policies in Cape Verde. The principle driving force was the desire for the transformation of Cape Verde which implies winning the battle of competitiveness and the modernization of the economy and the society. The government of Cape Verde bet on electronic governance is an imperative to improve the efficiency of the State, public administration, both central and local, thus strengthening the Rule of Law, since the information technologies help to promote transparency, accountability and democracy. Cape Verde also receives praise from the World Bank in relation to the case study -Small States, Smart Solutions. The world bank believes that Cape Verde has managed to overcome, through information and communication technologies, the handicaps of it size and isolation and reduce the costs and increase the effectiveness of public goods and services, and how to reduce the costs of connectivity with the rest of the world.

The government of Cape Verde identified four key phases towards achieving full and complete E-governance status. (Cape Verde Gov, Electronic Gov Action Plan, 2005). These includes:

- **Phase 1- Launching:** the provision of static information on the Internet to the public. At this stage, there is no communication between the government and its people through the E-government platform.

- **Phase 2-One Way Interaction:** The provision of critical information to the citizens, access to online forms for download, the provision of communication between state and citizens through emails, with or without replies.

- **Phase 3-Two-Communication:** There are unassisted computer applications available on the Internet for use by citizens and business, with extended portfolio of available services than the
previous phases, sharing of services amongst entities of the government with communication via the Internet.

- **Phase 4-Internet Interaction:** This is the final and complete stage of the E-government processes. With complete, integrated, transversal services available online and sometimes real time. At this stage taxes and other payments can be made via secured Internet. Government entities are fully coordinated with higher level of collaboration. (Cape Verde Gov, Electronic Government Action Plan, 2005)

### 2.5b Cape Verde-Infrastructure, Penetration, and Connectivity

There are very limited access to Broadband in the West African region, with so far the best been in Cape Verde only 1.48 subscribers per 100 inhabitants. The advantage earned by Cape Verde in the region is because of its higher telecommunication infrastructure and human capacity components which is the result of the government commitments.

### 2.5c Lessons Learnt from Cape Verde E-Government project

Cape Verde e-government is an exemplary case of how governments can harness the Internet where even developed countries can emulate. The issue of E-government was at the heart of the governance process with the involvement of highest level of government involved including the office of the Prime Minister. Cape Verde placed ICT as national priority, been a driving force for poverty reduction. Cape Verde introduced Action Plan towards the achievement of its E-government goals. Within the Action plan, there were six angles considered as the six axes, adopted for the purpose of ensuring the operationalization of the action plan. These six axes included:

- Interactive Public Services
- Electronic Democracy
- Efficient Public Administration
- Health for All
- Qualification of the Public Administration Human Resources
- Technological capacity

The government worked in several directions towards the attainment of the above axes in fulfillment of E-government. (Cape Verde Gov, Electronic Gov Action Plan, 2005)

### 2.5d Cape Verde Qualification of the Public Administration Human Resources

Capacity was critical factor identified for the successful implementation of E-government. The country ensured high strong focus on training and capacity at all level of governance. Cape Verde sets itself vision and objective that transformed the entire human capacity in readiness for e-government. As part of information society strategic program, Pillar 5 was ‘’Build New Competences’’. This emphasizes the critical nature of capacity. (Cape Verde Gov, Electronic Government Action Plan, 2005).

Amongst the priorities actions towards capacity enhancement were as follows:

- Training Program for Central Public Administration employees
- Training Program for Local Public Administration employees
- HRM-Human Resource Development
- Public Administration and Civil Servants Portal
Cape Verde followed the OECD established skills requirements for E-government, these grouped in four areas in this table:

<table>
<thead>
<tr>
<th>Skills</th>
<th>For</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Information Technology</td>
<td>All Employees, managers and ICT specialist</td>
</tr>
<tr>
<td>• Basic ICT Literacy</td>
<td></td>
</tr>
<tr>
<td>• Specialist ICT Skills</td>
<td></td>
</tr>
<tr>
<td>• Information Management</td>
<td>Managers and Specialist in Information Management</td>
</tr>
<tr>
<td>• Internal Information Management</td>
<td></td>
</tr>
<tr>
<td>• External Information Management</td>
<td></td>
</tr>
<tr>
<td>• Privacy protection</td>
<td></td>
</tr>
<tr>
<td>• Feedback mechanisms</td>
<td></td>
</tr>
<tr>
<td>• Information Society</td>
<td></td>
</tr>
<tr>
<td>• Understanding ICT potentialities</td>
<td></td>
</tr>
<tr>
<td>• Ability to evaluate trends</td>
<td>Managers</td>
</tr>
<tr>
<td>• Foresee ICTs impact on organization culture</td>
<td></td>
</tr>
<tr>
<td>• Ability to set ICT strategy</td>
<td></td>
</tr>
<tr>
<td>• Management/Business</td>
<td>Managers</td>
</tr>
<tr>
<td>• Organizational change</td>
<td></td>
</tr>
<tr>
<td>• Project Management</td>
<td></td>
</tr>
<tr>
<td>• Risk Management</td>
<td></td>
</tr>
<tr>
<td>• Accountable structures</td>
<td></td>
</tr>
<tr>
<td>• Financing arrangements</td>
<td></td>
</tr>
<tr>
<td>• Cooperation and collaboration</td>
<td></td>
</tr>
<tr>
<td>• Public-Private Partnership</td>
<td></td>
</tr>
</tbody>
</table>

(Cape Verde Gov, Electronic Government Action Plan, 2005)
2.6 Republic of Korea E-government Implementation Experience

Republic of Korea is the leader in the E-government wagon, according the UN 2010 E-government readiness index. This ranking creates curiosity for the researcher to investigate so as to ascertain why the country is so successful.

In the Republic of Korea computerization is understood as the establishment of administrative databases at the back office while Informatization as the promotion of use of IT including distribution of IT services, increase access to ICT services, literacy and digital divide. The Korean government considered e-government as carrying out governmental activities by using the Internet. The e-government projects are carried out with greater level of support and involvement of the President of Korea making it a national priority endeavor.

2.6a Korea e-government Journey

The office in charge of the Korea’s E-government project is the Lee Myung-bak Administration in charge of its E-government projects. Korea has succeeded in ranking first in both the e-Government Development Index and e-Participation Index of the UN Global E-Government Survey 2010.

<table>
<thead>
<tr>
<th>Category</th>
<th>2005</th>
<th>2008</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Government Development Index</td>
<td>5th</td>
<td>6th</td>
<td>1st</td>
</tr>
<tr>
<td>Web Measure</td>
<td>0.97 (4th)</td>
<td>0.82 (6th)</td>
<td>1.00 (1st)</td>
</tr>
<tr>
<td>Telecommunication Infrastructure</td>
<td>0.67 (9th)</td>
<td>0.69 (10th)</td>
<td>0.64 (13th)</td>
</tr>
<tr>
<td>Human Capital</td>
<td>0.97 (14th)</td>
<td>0.98 (10th)</td>
<td>0.99 (7th)</td>
</tr>
<tr>
<td>E-Participation Index</td>
<td>0.87 (5th)</td>
<td>0.98 (2nd)</td>
<td>1.00 (1st)</td>
</tr>
</tbody>
</table>

2.6b Korea-Infrastructure, Penetration and Connectivity

Korea has been one the leaders in e-government ranking, the world most ranked in e-government readiness (UN 2010) is exemplified by its level of technology penetration and the strength of its infrastructure.

In 1960, the Republic of Korea had a fixed-line density of 0.36 per 100 inhabitants, among the lowest in the world (ITU). Interestingly it now leads the world in broadband penetration and has developed into a world leader in ICT components and equipment manufacturing and services. Korea is: #1 Korea / 159 Countries ICT Development Index (ITU, 2011), E-Government Readiness Index (UN, 2010): #1 Korea / 192 Countries. Korea is at global top-level in ICT infrastructure and service penetration with Household penetration of High-speed Internet: #1 of the world => 0.1% (1998) -> 69% (2002) -> 97% (2009). Proportion of households with Internet. Mobile handsets penetration [subscribers per 100 inhabitants]: top-ranked

=> 3.6% (1995) -> 30% (1998) -> 68% (2002) -> 98% (2009), => Smartphone; 20 Million out of 50 M population (40%, Nov. 2011)
2.6c Lesson Learnt from Republic of Korea E-Government project

The republic of Korea was rapidly informatized during the 1990s. This was happening at the time when most public sector workers including senior management did not have much idea on what e-government was all about. Those who understood e-government were the ICT professional. In this context, the first major task was to sell the concepts, knowledge of what e-government was to all stakeholders and actors.

The Republic of Korea’s e-government approach largely consisted of three phases including design, development, and deployment. The design stage was where political leaders drove the e-government initiatives with the support of selected champions in the government who take the lead in creating awareness, thus providing increase social awareness in the country. At the design stage, political leaders drove the e-government initiatives, with selected champions carrying out activities to increase social awareness in the country. Secondly the social governance included the establishment of core agency to implement e-government needs to be built up. Thirdly, the core agency analyzed the given environments and fourthly, national and international cases were studied for benchmarking in the direction of ascertaining the right e-government platform.

One very important lesson learnt with the e-government experience in Korea was the top level government officials ‘involvement including their presidents ‘involvement. President Doo-hwan Chun (1981-1987) appointed the chief of staff to the president as the chairman of coordination committee for the 1st phase of the national basic information system (NBIS) project started in 1987. It was institutionally exceptional to designate the president’s staff as the committee chairman. During 1998-2002, President Dae-jung Kim who had a deep understanding as well as great interest in Information society agenda initiated the first phase of the e-government project which happened in 2001-2002. President Moo-hyun Roh (2003-2007) led the 2nd phase of the e-government project; he had an expertise in computers good enough to manage his server and some programming during his political careers. The presidents ‘involvement clearly shows the government readiness and support toward e-government.

*The Critical Success Factors of E-government Identified by Republic of Korea*
Strong Government Leadership
- Leadership from the President
- Strategic and sustainable plans for 20 years
- Nationwide change management program

(GOK2010)
- Aligned e-Government projects with Performance Evaluation

IT Governance
- Informatization Promotion Committee chaired by the Prime Minister mediates and guides the administrative branches
- Makes the national level e-Government strategies; work with NIA (National Information Society Agency)
- Revision of the legislative system for government process reform

Customer-oriented e-Government Services
- Service development based on the needs of citizens, company and other organizations, Civil Service closely related to everyday life

Performance Based Program Management
- Clear goals, objectives, short and long-term plans, with expected expenditure, income streams and deadlines
- Qualitative, Quantitative Performance Index (KPI) for nationwide level and each project level
- Designation of an officer or organizing body in charge of project performance

Technology Support
- Participation of experienced system Integration companies and specialized solution vendors
- Adoption of practical technology (GIS (Geographical Information System), LBS (Location-Based Service), Component Based Developing technology etc.

2.7 E-government implementation Experience- USA

United States of America is on the continent of America, one of the most leading countries in the world on technology. With most of world technology companies residing in the USA including the software giant Microsoft cooperation, this provides a lot more opportunities associated with ICT. Looking at the US case, the past two presidential administrations (Bush and Clinton) have had important but very different strategies in the area of digital government. The Bush Administration agenda focused on technology as a tool to improve services and performance of federal agencies. This strategy focused on transforming service delivery to citizens and businesses, as well as improving inter-governmental coordination and internal efficiency and effectiveness. While President Obama's strategy was still emerging, it appears to be focused more broadly on the enhancement of national technology capability in addition to the transformation of US federal government operations.

2.7a USA e-government Journey

E-Government, broadly defined by the Office of Management and Budget (OMB), is focused on improving how the government provides services internally and externally to citizens, businesses, and state and local governments. America sees the creation of an integrated environment based on policy framework, IT governance structure, and technological standards. And to a greater degree, strive to use E-government as a way to streamline the processes in collecting, handling, and processing of information and delivering services that involve multiple levels of government or multiple agencies. Since 1993 the USA have been involved in e-government initiatives during the Clinton-Gore administration with their reengineering through information technology efforts to enable government to be more customer-oriented and responsive to societal needs (Homburg, 2008). There form focused on improving efficiency, accountability, and performance in the federal government though the use of information systems. The engineering effort fuelled the
development of several national and inter-governmental information systems (Fountain, 2001). The Bush administration adopted the concept of e-government and identified e-government as a critical element in the management of government (—e-government Act of 2002, 2002). The e-government strategy claimed a focus on cross-agency integration and inter-operability to achieve performance and efficiency gains, identifying 24 projects that constituted the so-called—Quicksilver initiative (Executive Office of the President Office of Management and Budget, 2002). The Obama administration is focused on building a new Internet infrastructure and using ICT to improve openness and transparency of government operation. President Obama stated on April 25, 2009, To help build a new foundation for the twenty-first century, we need to reform our government so that it is more efficient, more transparent, and more creative. (The White House, 2009). On 21 January 2009, the president delivered a Memorandum for the Heads of Executive Department and Agencies, stating his commitment to openness, transparency, public participation, and collaboration (The White House Office of the Press Secretary, 2009). The memorandum also requires the Federal Chief Technology Officer (CTO), in collaboration with the Office of Management and Budget (OMB) and the General Services Administration (GSA), to draft an Open Government Directive to implement the key principles set forth in the memorandum. Prior to the election of President Obama, the World Economic Forum 2008–2009 Networked Readiness Index ranked the United States 3rd out of 134 economies. The Economist 2007 E-readiness Index ranked the United States 2nd out of the 69 economies, and finally, the United States ranks 4th in the UN E-government Readiness Index. The impact of the Obama administration on these rankings is not yet clear, but expectations for change are quite high.

2.7b USA-Infrastructure, Penetration and Connectivity

USA has one of the most structured technological infrastructures with well literate citizenry. The penetration of technology has been successful. The Internet penetration by USA places it at the leading edge of further adoption of new ICT. By December 2009 the number of adults in the United States using the Internet was 74%, up from 63% reported in 2003. The types of online activities American citizens are engaged in vary widely: from using e-mail (89%), buying products (75%), searching for news or information about politics or upcoming campaigns (60%), visiting government Websites (59%), using social networking sites such as MySpace, Facebook, or LinkedIn.com (47%), reading blogs (32%), sharing user-generated content (30%), and using Twitter or other status-update service (19%) (Pew Internet and American Life Project Tracking surveys, 2009). In the United States, 70% of Americans report that they expect their government to provide online information and services (Pew Internet American Life Project, 2007, p.7). This places far greater pressure on the government of USA to strengthen its quest for e-government.

2.7c Lesson Learnt from USA e-Government project

One major lesson learnt is the level of involvement of the seat of government in the implementation of e-government. Most successful e-government implementation are guided by the top of government for instance in the USA, in 1993, then U.S. Vice President Al Gore championed the task of establishing a vast web of advanced public and private communications networks and interactive services in an attempt to ensure the linking of all American to their government in their day to day activities on a seamless information superhighway. More than 20 years later, this vision has been achieved in virtually every part of the world in dozens and dozens of thriving e-government systems. In the American context, e-government is viewed broadly, involves using Web portals, mobile applications, kiosks, interactive TV, and other digital technologies to provide transparent, efficient, and inexpensive interactions with government agencies by individuals, businesses, or other government departments.

One area where President Obama has broken new ground is in the appointment of the first U.S federal government CIO—Mr. Vivek Kundra—in charge of the development of the information resource management strategic plan (The White House, 2009). This strategic plan was organized around six guiding principles including:
• Innovation in the economy.
• Innovation in science.
• Innovation in public administration.
• Restoring a culture of accountability through openness and transparency of government operations and information.
• Moving toward unprecedented openness.
• Making critical government information available.

Looking at the US case, the past two presidential administrations have had important but very different strategies in the area of digital government. The Bush Administration agenda focused on technology as a tool to improve services and performance of federal agencies. This strategy focused on transforming service delivery to citizens and businesses, as well as improving inter-governmental coordination and internal efficiency and effectiveness. While President Obama’s strategy was still emerging, it appears to be focused more broadly on the enhancement of national technology capability in addition to the transformation of US federal government operations. One area where President Obama has broken new ground is in the appointment of the first U.S. federal government CIO—Mr. Vivek Kundra—in charge of the development of the information resource management strategic plan (The White House, 2009). This strategic plan was organized around six guiding principles including:
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• Moving toward unprecedented openness.
• Making critical government information available.

2.8E-Government Readiness Index

E-government readiness index is the United Nations methodology, in analyzing its member countries’ the position regarding strength, weakness and ranking of e-government implementation. The methodology utilizes sets of data of each country and then rank each country on the basis of the analyzed data collected of all UN member countries (192). The objective of the UN utilizing this methodology is to provide a well-tested, uniformed methods of analyzing each country’s preparation and readiness. There are three key areas utilized for the analysis including Infrastructure, Human Capacity and Web measure as discussed below.

Organizations such as The United Nations and ITU have established set of factors that will determine the position of each country in the readiness level of E-Government. The E-government readiness index is a systematic method of identifying the E-Readiness states of its member’s countries. E-Government readiness index identifies the position or status a country stands in fulfilling the concept of E-Government, the fulfillment includes Infrastructure, Human Capacity and Web measure etc.

The method uses composite measurements of the capacity; willingness of member countries to use E-Government for ICT led development. The UN in its reports gives position of each member states in the rank or greater level of readiness or less, in most cases developed countries are ranked higher than underdeveloped countries, this is because the developed countries have better telecommunication infrastructure, highly educated citizenry and government’s activities been presented in web than developing countries. Along with assessment of the web sites development pattern of countries, the E-government readiness index incorporates the access characteristics such as infrastructure and educational levels of its people, to reflect how a country is using information technologies to promote access and inclusion of its people in governance and their level of participation in decision making of the country.

The measurement of E-government is an assessment of state’s use of internet and the World Wide Web (WWW) for provision of information, products and services; plus the level of telecommunication and human capital infrastructure in a country. The E-Government readiness Index is a composite score
made up of the following:
- The ICT Infrastructure Index
- The Human Capital Index
- Web measure Index

2.8a The ICT Infrastructure Index

The Telecommunications Infrastructure Index is a composite score itself made up of six primary indices including
- Personal computers (PC’s)/1000 persons
- Internet users/1000 persons
- Telephone lines/1000 persons
- Online population/1000 persons
- Mobile phones/1000 persons
- Televisions/1000 persons

These data were taken from the United Nations International Telecommunications Union (ITU) and the United Nations Statistics Division, and supplemented by the World Bank.

2.8b The Human Capital Index

In representing the education level of each country, the index is again weighted with two-third weight of adult literacy and one-third to weights to enrolment.
The Human Capital Index is a composite score derived from the United Nations Development Program (UNDP) education index, comprised of the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio, with two thirds given to adult literacy and one third given to gross enrolment.

2.8c Web Measure Index

The Web Measure index represents the sophistication level of online citizen services, the Index is a score derived from a quantitative analysis of the national web presence of the 191 member states. (Note that in each of the three annual survey periods—2003, 2004, 2005 and most recently 2009—a handful of countries did not have interactive national government websites). The research team used a survey instrument with more than 200 indicators to assess the national government websites (at least one and in many instances two national websites/portals were identified and assessed for each country) along with five ministry sites which align with the UN Millennium Development Goals (these ministries include education, health, labor, social welfare, and economic development/finance). In the various surveys, at least the six official languages of the United Nations (Arabic, Chinese, English, French, Russian and Spanish) and to the extent feasible and necessary (for example when a site was not available in one of the six UN languages) numerous additional languages were utilized to assess particular country sites. Notably, in 2005 every national site was assessed in the official language of the country, or in the primary language provided on the website. The UN Reports include as part of the measurement methodology a five stage model of the E-government development, as set forth in the Web Measure Assessment Model. A brief summary of each of the stages, included in the UN Reports is detailed as follows:
- Emerging Presence
- Enhanced Presence
- Interactive Presence
- Transactional Presence
- Networked Presence

**Emerging Presence.** Stage I e-government presents information which is limited and basic. The e-
government online presence comprises a web page and/or an official website; links to ministerial/departments of education, health, social welfare, labour, and finance may/may not exist; links to regional/local government may/may not exist; some archived information such as the head of states’ message or a document such as a constitution may be available online; most of the information remains static with the fewest options for citizens.

**Enhanced Presence.** In Stage II the government provides greater public policy and governance sources of current and archived information, such as policies, laws and regulation, reports, newsletters, and downloadable databases. The user can search for a document and there is a help feature and a site map provided. A larger selection of public policy documents such as an e-government strategy, policy briefs on specific education and health issues. Though more sophisticated, the interaction is still primarily unidirectional with information flowing essentially from government to citizen.

**Interactive Presence.** By Stage III the online services of the government enter the interactive mode with services to enhance convenience of the consumer such as downloadable forms for tax payment, application for license renewal. Audio and video capability is provided for relevant public information. The government officials can be contacted via email, fax, telephone and post. The site is updated with greater regularity to keep the information current and up to date for the public.

**Transactional Presence.** Stage IV allows two-way interactions between the citizen and his/her government. It includes options for paying taxes; applying for ID cards, birth certificates/passports, license renewals and other similar C2G [citizen-to-government] interactions by allowing him/her to submit these online 24/7. The citizens are able to pay for relevant public services, such as motor vehicle violation, taxes, fees for postal services through their credit, bank or debit card. Providers of goods and services are able to bid online for public contracts via secure links.

**Networked Presence.** Stage V represents the most sophisticated level in online e-government initiatives. It can be characterized by the integration of G2G [government-to-government], G2C [government-to-citizen], and C2G [citizen-to-government] (and reverse) interactions. The government encourages participatory deliberative decision making and is willing and able to involve the society in a two-way open dialogue. Through interactive features such as web comment forms and innovative online consultation mechanisms, the government actively solicits citizen views on public policy, law making, and democratic participatory decision making. Implicit in this state of the model is the integration of the public sector agencies with full cooperation and understanding of the concept of collective decision making, participatory democracy and citizen empowerment as a democratic right.

It is important to note here that while the UN puts forth this stage model of e-government development, it is primarily as a framework for the research methodology, and not necessarily as a linear, evolutionary model of e-government. In fact, the UN Reports throughout, note that countries can, and do, implement e-government services and initiatives often from the various stages without any sort of real evolution, and can, in fact leap frog whole stages of e-government development. The indicators for the Web Measure survey were formulated as questions that were answered by researchers observing the national and the various ministries websites for each of the countries. The questions were grouped according to the five stage model above to provide structure and focus to the survey process:

**Stage I** evaluates whether the country has a national website with links to regional and ministry sites through questions such as whether the homepage provides a link to other national government sites;

**Stage II** concerns whether the country website provides current and archived information on law And policy, as well as basic user-friendly web features through questions such as whether archived information and documents can be found on the site;

**Stage III** assesses the interactive presence ranging from downloadable forms to specific contact
information for public officials through questions such as whether specific contact methods are readily available;

**Stage IV** evaluates whether the country provides for opportunities for online transactions through questions such as whether taxes can be filed and fees paid online;

**Stage V** represents the most sophisticated level of e-government development with features that facilitate two-way communication—ranging from discussion groups and online surveys to web comments and online consultation through questions such as whether a feedback mechanism is readily available.

### 2.9 Selected E-Government Maturity Models

The methodologies employed to capture where each country is in line with e-government implementation is what is referred to as e-government maturity model as identified and agreed by researchers. The models are several including World Bank three stage models, Chandler and Emanuel's four models, Gartner's four stage model, United Nations five stage model, West's four stage model etc. Each model presents different number of stages and expected outcomes or deliverables at each stage from infancy to maturity of e-government implementation as described below. The models allow a systematic, uniformed way of implementing e-government.

E-government evolves through many stages from infancy to maturity, from the basic stage of providing static information to citizens on its web site to the stage where there is higher level of collaborations and interactions between different government entities, between citizens and government and between governments and government across borders. Scholars and researchers have come out with several different maturity models which are discussed briefly below. Research has shown that most governments’ E-government implementations have only centred on **publishing** information for public consumption. Study by Anderson consulting also indicated that there is vast different between different governments' E-government maturity level especially between developed and developing countries. The finding also indicated that even with developed countries with mature level of the model, they have tapped just around thirty percent of the potential benefits of E-government.

The E-government maturity model takes into consideration a staged approach in the implementation of E-government which is highly recommended in order to develop and implement a robust and reliable E-government infrastructure and allow management monitor progress of the development process. The most basic stage of E-government is the simple provision of government information in a portal using static data, the next higher level is the provision of communications facilities between citizens and government; this is at the lower level a one way communication from government to its citizens and at a higher level two way communication which allows communication not only from government to its citizens but also from citizens to government. Another level is the provision of transaction facilities where citizens are able to interact with government and carry out their transactions online including paying taxes online, to the highest level with a fully and completely integrated systems of all government entities/departments and sections, this requires a complete transformation of government ways of work from a traditional mode of interaction between citizens and government to a more robust and digital driven functional mode.

There are numerous agreed models of analyzing maturity level of e-government implementation. The choice of which model for analysis is made by individual country.

We describe ten of the models as follows:

1. Chandler and Emanuel's four model
2. Gartner's four stage model
3. United Nations five stage model
4. West's four stage model
5. Hiller and Blanger's five stage model
6. Moon's five stage model
7. Asia Pacific's Six stage model
8. Deloitte and Touche’ six stage model
9. Howard’s three stage model
10. World bank’s three stage model

2.9a Chandler and Emanuel’s four stage model
Chandler and Emanuel (2002) have a four stage model including information stage, interaction stage, transactional stage and integration stage.

**Information Stage:** Chandler and Emanuel consider the information stage as the preliminary stage of their model. Government places its services online on static web sites usually permitting only one way communication-from government to citizens. This is considered the basic stage of the E-government implementation model.

**Interaction stage:** According to Chandler and Emanuel, the interaction stage builds on the information stage with improvement where simple interaction between citizens and governments are enhanced and improved. The web sites are better improved with greater features and functionality, features that allow citizen search from large database, provide email communication facility between government and its citizens in two ways channels where citizen communicates to government and government communicates to citizens. For instance, citizens giving the ability to send email communication to government thereby enabling government the knowledge of citizen’s opinion which could influence the way governments are run.

**Transaction Stage:** This is third stage of Chandler and Emanuel’s model, where government services in the forms of transactions of values between citizens and his government. For instance citizens are able to pay their taxes online, fill and submit forms online such as passport request form, which would have required physical presence to do.

**Integration Stage**– Chandler and Emanuel consider the integration stage as the final and most matured stage of their model. They argue that vertical and horizontal integration of services across various government entities and agencies. There is a single portal of government services which allow citizens carry out complete but piecemeal transactions interacting with more than one government entity at the same time.

2.9b Gartner’s four stage model
Gartner group (2000) developed a four staged e-government maturity model including Web Presence, Interaction stage, Transaction Stage and Transformation Stage,

**Web Presence Stage:** Considered the initial stage where government provides static websites with basic information that the citizen can access for informational purposes. This allows government communicates its policies to citizens, allowing a single channel of communication from government to citizens only.

**Interaction Stage:** An improvement over the web presence stage where government provides websites including many more capabilities that includes search engines, the ability to download documents including forms, carry out email communication between citizens and government through various government agencies.

**Transaction Stage:** Far more improved stage where the users of the services are able to conduct complete on-line transactions such as buying and selling activities. Citizens are able to make payments for government services online.

**Transformation Stage:** this is the last phase, where all government operational processes are integrated, unified and personalized.
2.9c United Nation’s five stage model
United Nation (2001) proposed a five stage model with a focuses on web-based public service delivery as follows:

- Emerging web presence
- Enhanced web presence
- Interactive web presence
- Transactional web presence
- Seamless/Networked web presence

**Emerging Web Presence:** The first stage of the UN’s five stage model—this is the initial stage were government websites provides mostly basic and limited static information with less options for citizens. This is simplest and less sophisticated stage of the model.

**Enhanced Web presence:** This is the second stage, with improvement of government websites in-terms of providing dynamic, specialized and regularly updated information for citizens and public access. Among the website features include search facilities, on-line help, and site maps. **Interactive Web Presence:** Users and service providers are connected to government portals (websites); Interaction became more sophisticated than in the former stage. Services such as search facilities and accessibility of various forms are enhanced.

**Transactional Web Presence:** This stage allows two-way interactions between the citizen and the government; users can conduct complete on-line transaction including buying and selling activities.

**Seamless/Network Web Presence:** This is the most sophisticated level of e-government service delivery; all services and functions across all government levels, sections and departments are integrated; citizens can access any kind of services from a central location known as **Portal** at any given time.

2.9d West’s four stage model
Darral West (2000) proposed a four stage model of e-government development/maturity model. The stages and description of the model are:

- **Billboard**
- **Partial service delivery**
- **Full integrated service delivery**
- **Interactive democracy with public outreach and accountability**

**Billboard:** this is the stage where static websites are used for information display. The web sites include various types of information including reports and publications. Giving easy access to information by citizens and other visitors of the web site.

**Partial Service Delivery:** — at this stage government starts to set services on-line for citizen to access; at this level the on-line website has more capabilities and functionalities include sorting and searching of information.

**Full Integrated Service Delivery:** one stop centre is created (government portal) with full integrated online services; citizen can easily access government and agencies information from one service centre.

**Interactive democracy with Public Outreach and accountability:**
According to West [23] this is the final stage of e-government development model. Government websites are developed into a system wide political transformation with executable and integrated on-line services. Citizens can easily access government information and also customize the on-line government information service delivery system(s).
2.9e Hiller and Blanger’s five stage model
Hiller and Blanger (2001) proposed a five stage model as follows: **Information dissemination, Two-way communication, Service and financial transaction, Vertical and horizontal integration, Political participation**

**Information dissemination**: – this is the initial stage of the government to disseminate information to the citizen by posting it on the website (static), the communication is one-way.

**Two-way communication**: -at this stage government uses enhanced websites with various capabilities such as emails and downloadable forms to interact with citizens. Because of the two way communication facilities both government and citizens interchange communications in the form of emails.

**Service and Financial transaction**: – this is advanced stage of the previous one. With this stage, government offers online services including financial transaction to citizens and other partners, thus requiring highly sophisticated environment.

**Vertical and horizontal integration**: – the government integrates various systems at different levels vertically and horizontally.

**Political Participation**: – government involves citizen in political participation activities including online voting and forums. This is one very tool that enhances democracy as citizens are not aware of what are happening but they take part in the decision making process of their country using ICT as the tool.

2.9f Moon’s five stage model
Moon (2002) developed a five stage model: **One way communication, Two-way communication, and Transformation, Vertical and horizontal integration, Political participation**

**One way communication**: This is considered as the preliminary stage of e-government developments where government disseminates information to the citizen by posting on the website, and citizens can access online.

**Two-way communication**: -at this stage government uses enhanced websites with various capabilities such as emails and downloadable forms to interact with citizen achieving two way communications between the two entities (government and citizens)

**Transformation**: – a more advanced stage of the model, where government offers online services including financial transaction to citizen. This phase requires more sophisticated technology.

**Vertical and horizontal integration**: the government integrates various systems at different levels vertically and horizontally.

**Political participation**: – government involves citizen in political participation and decision making processes and activities including online voting and forums.

2.9g Asia Pacific’s six stage model
Asia Pacific (2004) region based on their experience of e-government development – proposed a six stage model:- **Setting up an email system and internal network, Enabling inter- organizational and public access to information, Allowing 2-way communication, Allowing exchange of value,**
Digital democracy, Joined-up government

Setting up an email system and internal network
This is the initial stage where most of government systems focus on internal processes that support basic administrative functions such as e-mails and payroll

Enabling inter-organizational and public access to information
This stage involves government into developing systems that will help in managing its workflow from paper based to electronic format (inter-organizational); Also at this stage citizen (public) are able to access government information through the use of internet

Allowing 2-way communication
Government and the citizen (public) use ICT as enabler for communication. For instance telephone, fax numbers or email addresses are posted on a website, this encourage public to send messages to the government and receive response

Allowing exchange of value – at this level, ICT is used to support development of more flexible and convenient ways for citizens to conduct business with the government. Citizens have the opportunity to utilize the available on-line government services including tax assessment, visa application and license renewals

Digital Democracy
With digital democracy stage, citizens use ICT as an enabler that can potentially support participatory and democratic processes in a country. Such a platform empowers citizens and civil society organizations using online applications

Joined-up government
This is the final stage where there is both vertical and horizontal integration of service delivery, a web-portal integrates information and services from various government bodies/agencies. This way citizen and other stakeholders get seamless services without needing to know what government, department or agency is responsible

2.9h Deloitte and Touche’s six stage model
Deloitte and Touch (2001) presents a six stage model based on the view that e-government objectives should serve citizens building a long term relationship between government and citizens and other partners of governments Deloite and Touche models include: Information publishing, Official-two way transaction, Multipurpose portal, Portal personalization, Clustering of common services, Full integration and enterprise transaction

Information publishing
At this stage government sets up websites (static) for providing information to citizen users. At this stage the communication is on-way

Official-two way transaction
This is an advanced stage of the former were information are transacted and exchanged between citizen as users and government/agencies as service providers

Multipurpose portal
Government uses a single portal as a single point of entry to effectively provide services to its departments, agencies and to citizen;

Portal personalization
This stage provides citizen/users with the opportunity to customize the portal based on their desired features
Clustering of common services
All government services and operational processes are clustered along common lines so as to provide unified and seamless services to citizen

Full integration and enterprises transaction:
Government changes its structure and provides more sophisticated, integrated and personalized services to citizen

2.9i Howard’s three stage model
Howard (2001) developed a three stage model including Publishing, Interacting, and Transacting

Publishing
This is the initial stage of e-government development were Information about activities of government is available online

Interacting
this is the advanced stage of the former; citizens have the ability to do simple interactions with governments; available services at this level include sending e-mail, chat rooms, and/or filling and sending forms

Transacting
Based on the model design this is the highest stage of e-government development. The stage enables citizens to conduct transactions over the Internet, including purchasing payment of licenses and permits.

2.9j Word Bank’s three stage model
Word Bank (2003) proposed a three stage model including Publishing, Interactivity and Completing transaction

Publishing
This is the first stage, government disseminates information to citizen through website; all important information is posted on the website

Interactivity
At this phase government interacts with citizen. Websites are enhanced with interactive capabilities such as feedback forms and email

Completing transaction
This is the final stage of e-government development; citizen/users can use the opportunity of the available technically enhanced website to conduct complete and secure transactions on-line.
CHAPTER THREE

3.0 Research Methodology

3.1 Introduction

The study is focused mainly on the identified ministries namely ministry of finance, ministries of commerce and planning and economic affairs to identify the level of ICT involvement in the ministries towards e-government implementation. Employees were identified at various levels including senior management, middle level management, users and possible actors who will interact with the developed systems including higher education students.

Research is defined by Leedy (1989-4-8) is considered as a through process on accumulated facts and data in order to determine what the facts –sayll and what the data means. Research is also considered as a method of action by means of which people solve problems in an endeavor to extend the boundaries of knowledge. Hence research encompasses the interpretation of data in order to reach a conclusion (Bryant and Hanckon, 1997.2) According to Higher Education Funding Council for England, research is defined: an original investigation undertaking in an order to gain knowledge and understanding (HEFCE, 1998). According to Shar et al.s (2002:7): Research is defined as a through methodological process to add to one’s own body of knowledge and that of others by the discovery non trivial facts and insights. The definition clearly argues that research must not follow an ad hoc approach but planned and pursued in a considered way thus methodological with given objective or deliverable.

The good researcher is not one who knows the right answers but one who struggles to find out what the right questions might be. This research methodology strive included extensive literature review of the study area. Several literature including books, articles, UN documented materials, web sites including those of governments that have implemented e-government platforms. The literature review also included reviewing institutional documents of the relevant government entities. Using the research of Zikmund (2000), the researcher would analyze the collected data, and provide conclusions and recommendations. The conclusions and recommendation provided are derived from the collected and analyzed data including observation, therefore the accuracy of the data is a critical influencing factor, keeping in mind the concept ‘garbage in garbage out‘. Another part of the research methodology is the creation of questionnaire which was distributed to staff members of the Ministries, the target audience of the questionnaires was about 100 including senior management, the questionnaires is followed by a request for a single page opinion from selected staff targeting 10 persons including managers, junior staff. The single page as depicted in appendix (a) sought to unravel the personnel opinions, perception, and challenges of establishing E-government at the ministries by the staff members. The research process also included observation and spot checking in addition. Interview was held with key staff members whose knowledge on ICT in the ministries and in government is wide so as to help inform the thesis output.

3.2 The Purpose of the Research

There are various ways for referring or categorizing research in the name of enquiry. Researchers argue that the task of research can be categories either in terms of their purpose, or its associated strategy. Saunders et al 2000) argues that enquiry can be classified in terms of their purpose as well as by the research strategy which is used (Robson, 1993). This classification can be in three folds:

- Exploratory
- Descriptive and
3.2a Exploratory Studies

These are valuable means of finding out ‘what is happening; to seek new insight; to ask questions and to assess phenomena in a new light’ (Robson, 1993). It is a particular useful approach if you wish to clarify your understanding of a problem and is suitable when the researcher is uncertain which theories are relevant and when important characteristics and relations are difficult to determine. Exploratory research is conducted into an issue or problem where there are few or no earlier studies to refer to. The focus is on gaining insights and familiarity for later investigation. Exploratory research is a type of research conducted for a problem that has not been clearly defined. Exploratory research helps determine the best research design, data collection method and selection of subjects. It should draw definitive conclusions only with extreme caution. Exploratory research often relies on secondary research such as reviewing available literature and/or data, or qualitative approaches such as informal discussions with consumers, employees, management or competitors, and more formal approaches through In-depth interviews.

3.2b Descriptive Studies

The object of descriptive studies is ‘to portray an accurate profile of persons, events or situations’ (Robson 1993). This may be an extension of an exploratory research. It is necessary to have a clear picture of the phenomena on which data will be collected prior to the collection of the data. The application of Descriptive studies consists of two major groups such as those that relate to individual and population. One popular area of application is within the medical research. They are often the first applied into a new disease or area of inquiry by medical researchers. A descriptive study is concerned with and designed only to describe the existing distribution of variables, without regard to causal or other hypotheses. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984), thus developing an understanding of the collected data using visual aids such as graphs and charts for ease of understanding. The study method produces report in the form of summary data such as measures of central tendency including the mean, median, and mode, deviance from the mean, variation, percentage, and correlation between variables.

3.2c Explanatory Studies

Explanatory studies encourage flexibility in the use of the methods applied during the studies. Instead of following formal procedures, the researcher has to be open to new idea and insights which may redirect the exploration in a new direction. Consequently, the focus of the research may shift as the work proceed and new knowledge obtained (Malhotra, 1996). Using this method, the researcher attempts to investigate reasons or causes of particular phenomena. Such research carefully tests causal hypotheses (Campbell and Stanley, 1963; Cook and Campbell, 1979; Dowdall et al., 1999). It also rules out rival explanations. The major objective of explanatory research is to provide answer to the question why. Explanatory research also attempts to build and elaborate on theories and add to predictions and principles where possible. This is done by using the scientific method to test the evidence to extend an idea put forth or uses it to reach into new areas and issues as well as new topics which science can address in an attempt to improve the quality of life.

3.3 The Research Design

With the desire to carry out greater level of research in future research for PhD level, the researcher has tuned to the research methods and approach of the Exploratory Approach. Documents reading including the 2010 National ICT policy (GOL 2010), national budget documents (GOL 2010), questionnaire as depicted in appendix (b) are employed. The national ICT policy provided detailed rules,
regulations and standards implemented in the ICT in the public sector. There were reviewing and analysis of existing documentations of existing systems and applications within the Ministry of finance. The findings from these pieces of documents and the understanding of the questionnaire were good tools for the analysis and recommendations including most importantly the interview. The questionnaires were collected and thoroughly checked for any missing fields, where necessary follow-up was carried out. Questionnaires as depicted in appendix (b) had been delivered to expected respondents at the various ministries.

The emphasis of the research approach also conducted face to face interview, sample script and details as depicted in appendix (c) on with key persons whose knowledge on ICT, E-government were perceived strong. Where face to face interview was not possible, the researcher conducted phone and email fashion of interview in collecting data. The researcher used the exploratory research approach to obtain greater understanding of a concept or to help crystallize the definition of the existing, perceived problem at the place of study. It is also used to identify important variables to be studied and possibly for the future research as exploratory research is preliminary research, not the definitive research used to determine a course of action. Exploratory Research Approach can have several forms including; Pilot studies, Experience surveys, Secondary data analysis and Case analysis. Using Pilot studies, the researcher uses using a limited number of respondents and often employing less rigorous sampling techniques than will be used in large scale quantitative studies.

3.4 Method of Literature Review Research Design

3.4a Literature Review Process

A literature review is an objective, thorough summary and critical analysis of the relevant available research and non-research literature on the topic being studied (Hart, 1998). Its goal is to bring the reader up-to-date with current literature on a topic and form the basis for another goal, such as the justification for future research in the area. A good literature review gathers information about a particular subject from many sources. It is well written and contains few if any personal biases. It should contain a clear search and selection strategy (Carnwell and Daly, 2001). Good structuring is essential to enhance the flow and readability of the review. Accurate use of terminology is important and jargon should be kept to a minimum. Referencing should be accurate throughout (Colling, 2003). Notably we will introduce two forms of review: systematic review and traditional or narrative.

3.4b The Traditional or Narrative Literature Review

A "traditional" literature review provides an overview of the research findings on particular topics. A traditional literature is written by examining a body of published work, then writing a critical summary (an impressionistic overview) of the body of literature. The purpose of a literature review is to make clear for a reader what the research collectively indicates with regard to a particular issue or question. Literature reviews are vital documents for organizing and making accessible the major findings in an area of inquiry. Literature reviews are often used, for example, to inform policy and future research directions. Conducting reviews of literature is particularly important as a field of inquiry expands or changes. A good traditional literature review will usually consider research evidence in light of an established theoretical framework. A theoretical context can enable meaningful synthesis and interpretation of research findings (e.g., see the review by Barret & Greenaway, 1995b). A traditional literature review is not foolproof - it has some strengths and weaknesses. The method involves authors reading original (primary) studies, taking notes, organizing themes, and immersing themselves in the research literature in order to develop a comprehensive understanding of the main findings.
3.4c The Systematic Literature Review

The systematic literature review is the main research method used to answer the Research Questions in the research. Systematic Literature Review (SLR) is defined as a process of identifying, assessing and interpreting all available research evidence with the purpose to provide the answers for specific research questions (Keele 2007). However, a systematic review, as defined by Cook et al, is the application of scientific strategies that limit bias by the systematic assembly, critical appraisal and synthesis of all relevant studies on a specific topic. Systematic literature review is also called systematic review, is a systematic approach to identify, evaluate and interpret research available about a particular area of interest (Kitchenham 2004). SLR is a structured and predefined search strategy that provides an unbiased approach to identify the primary studies and to comprehensively aggregate the published literature (Kitchenham 2004). According to (Petersen et al. 2008) as a research area matures there is often a sharp increase in the number of reports and results made available, and it becomes important to summarize and provide overview.

While we have been inspired by the systematic literature review method, we have choosing the traditional literature review method for the thesis. Systematic literature review takes guidance from Keele, (Keele 2007) and as produced by Kitchenham, (Kitchenham 2004).

In our research approach, we reviewed the protocol that specifies the research question being addressed and theme that was used to perform the review, been based on defined search strategy that aims to detect as much of the relevant literatures possible towards the research theme. We identified explicit inclusion and exclusion criteria to assess each potential primary study.

3.4d the Systematic Review Process

A systematic review involves several discrete activities. Existing guidelines for systematic reviews have different suggestions about the number and order of activities (see AppendixI). This document summarizes the stages in a systematic review into three main phases:

- Planning the Review
- Conducting the Review
- Reporting the Review.

The stages associated with planning a review are:
- Identification of the need for a review
- Development of a review protocol.

The stages associated with conducting the review are:
- Identification of research
- Selection of primary studies
- Study quality assessment
- Data extraction & monitoring
- Data synthesis.

Reporting there view is a single stage phase.

Though the stages a listed above seem sequential in nature, it is worth noting that there are several stages that are iterative in nature. In particular, many activities are initiated during the protocol development stage, and refined when the review proper takes place as more details are uncovered by the researcher. For example:

- The selection of primary studies is governed by inclusion and exclusion criteria. These criteria are initially specified when the protocol is defined but maybe refined after quality criteria are defined.
- Data extraction forms initially prepared during construction of the protocol will be amended when quality criteria are agreed.
- Data synthesis methods defined in the protocol may be amended once data has been collected.
3.4e Planning the Review

This phase is mainly concerned with the development of review protocol and the steps to conduct literature review in a systematic way (Kitchenham & Charters, 2007), consisting of two steps: Identification of the need for a review and a review protocol.

3.4f Defining research questions

In order for us to understand the challenges and prospects of establishing e-government in Liberia focus on the identified ministries, the following research questions will be answered:

Q1: What views are expressed on electronic government/e-governance in articles and journal associated with developing countries?

Q2: What are considered, accepted implementation platforms for developing countries?

Q3: what are specific challenges and prospects reported and expected benefits on e-government implementation?

3.4g Review Protocol Development

The review protocol is the accepted defined procedures that will be used to carry out a specific systematic review (Kitchenham, 2004). It assists in minimizing the probability of researcher's bias (Kitchenham, 2004). The review protocol consists of:

- search strategy
- study selection criteria
- quality assessment criteria
- data extraction form
- data synthesis strategy

- **Search strategy**

The Search strategy helps in providing answers to the research questions effectively. The search strategy for this research is based on the following steps:

a) **Key Words**

Following are the keywords extracted from the RQs:
- E-government implementations
- E-government maturity models
- E-readiness Concepts
- Challenges of establishing e-government
- Concepts, applications, failures of e-government
- E-democracy,
- E-governance

b) **Search String**

The articles will be selected based on the full-Text search criteria. Following is the search string developed from the keywords mentioned above.

"("e-government implementations" OR e-government maturity models, e-readiness concept, challenges and benefits of establishing e-government”’e-gov. in developing countries’’)


c) **Resources**

Following electronic sources of relevance for software engineering subjects are searched:

- **Bth e-library**
- **EiVillage2(Compendex, Inspec)**
- **google search**
- **ACM Digital Library**

**study selection criteria**

The study selection criteria are used to identify the research articles appropriate for the research scope. The articles will be selected on the basis of title, abstract, introduction and conclusion that match best with our research questions. The articles will be selected by using keywords, synonyms, alternate words, and revised keywords mentioned above.

a) **Inclusion criteria**

The Inclusion criteria that will be used to select the research articles are described in table 3.0

<table>
<thead>
<tr>
<th>Step</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| Overall                        | • English Language
 |                                | • Date/Age of the publication |
 |                                | • Full text                                                              |
 |                                | • Non duplicate                                                         |
| Title and abstract             | • Contains search words associated with e-gov.                           |
 |                                | • Emphasizes the key words used for search string                        |
| Introduction and the conclusion| • Contains empirical background                                           |
 |                                | • E-government concepts                                                 |
| Full text                      | • Presence of empirical data in the articles                            |
 |                                | • General aspects, factors, benefits, challenges of e-government         |

Table 3.0

b) **Exclusion criteria**

The research articles will be excluded that do not meet the criteria mentioned above in Table 1.0

- **Bth e-library**
- **google search**
- **CM Digital Library**
- **Using search keywords**
- **Titles and abstracts**
- **Introduction and conclusion**

Using the inclusion and exclusion criteria, the resulting to the selected articles.
3.4h Data Extraction Strategy

The main objective of the data extraction process is to design data extraction forms that will allow an accurate recording of the information collected during the primary studies. The study uses Microsoft Excel (MS) spread sheet to extract the data from the primary studies in order collect relevant data to address research questions and data synthesis. General information regarding research study/articles

- Title of Articles
- Name of Author
- Publication year/Age
- Retrieval search query

Study
What are the prevailing views expressed on e-government implementations Challenges and benefit of establishing e-government expressed especially in developing countries

3.4i Quality Assessment Criteria

As suggested by (Kitchenham 2004), we developed a checklist to assess the quality of the selected primary studies. The primary studies were evaluated based on the quality criteria presented below:

- The aim and objective of the study clearly articulated? Yes, no, partially
- The techniques and method used clearly articulated? Yes, no, partially
- Are the concepts and principles of e-government well-presented Yes, no, partially
- Are the empirical evidences provided clearly Yes, no, partially

3.4j Data Synthesis Strategy used in this thesis

We employed data synthesis strategy as described (Keele 2007) (Kitchenham & Charters 2007), by Collecting and summarizing the results of the primary studies is called data synthesis (Keele 2007) (Kitchenham & Charters 2007). Synthesis can be qualitative (non-quantitative or narrative) and it is sometimes possible to complement with a quantitative summary (Keele 2007). In descriptive synthesis extracted information about the studies (i.e. intervention, population, context, sample sizes, etc) should be tabulated in a manner to answer the review (Keele 2007). Homogeneous or heterogeneous types of results should be identified and extracted into structured tables (Keele 2007).

Line of argument synthesis, an approach to qualitative synthesis, is used in this case, I am concerned about what they can infer about a topic as a whole from a set of selective studies that look at a part of the issue (Keele 2007). In the thesis, the first step of the synthesis I employed was to identify the aspects, concepts, terminologies, etc related to the e-government, e-governance, e-democracy, e-government in developing countries bringing that to Liberia. These were extracted into a data extraction form and then placed into structured tables. Finally, primary studies were grouped with similar findings or results.

3.4k Identification of Research

The main reason of a systematic review is to determine, evaluate and interpret the available research related to particular research questions. The search strategy for this research is based on different steps which are already mentioned. The keywords are identified from the research questions which aim to find out the research articles regarding e-government. Then these keywords are revised to choose synonyms and alternative words, in order to cover large numbers of publications. Finally the Boolean operators „AND‘ and „OR‘ are used to identify the related areas. Publication bias is one of the major problems in systematic review. According to (Kitchenham & Charters, 2007) “*Publication bias refers to the problem that*
positive results are more likely to be published than negative results” (Kitchenham & Charters, 2007). Following are the steps that are used to address this problem (Kitchenham & Charters, 2007).
- Scanning the grey literature
- Scanning conference proceedings
- By approaching professionals in order to know about any unpublished results.
- And also by performing manual searching online.

3.4 Selection of Primary Studies

The research articles are selected based on the tollgate approach, which consists of three different stages. We used the same search string for each database according to its own specific format requirements. The tables below show the details of search string used in this research study.

<table>
<thead>
<tr>
<th>SR#</th>
<th>Database/Source</th>
<th>Search String</th>
<th>Total no. Of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BTH e-library</td>
<td>TITLE-ABS-KEY(&quot;electronic government&quot; OR e-gov. OR &quot;electronic governance&quot; OR &quot;e-democracy&quot; OR &quot;e-government challenges&quot; AND e-government prospects&quot;)</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>Engineering Village</td>
<td>((&quot;electronic government&quot; OR e-gov. OR &quot;electronic governance&quot; OR &quot;e-democracy&quot; OR &quot;e-government challenges&quot; AND e-government prospects&quot;)</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>ACM Digital Library</td>
<td>((&quot;electronic government&quot; OR e-gov. OR &quot;electronic governance&quot; OR &quot;e-democracy&quot; OR &quot;e-government challenges&quot; AND e-government prospects&quot;)</td>
<td>74</td>
</tr>
</tbody>
</table>

Table 3.1

The research articles are selected using several stages, using the same search string for each source of data or database including:
- BTH e-library
- google search
- ACM Digital Library
- GOL web sites
- Engineering Village

Tables below show the details of search string used in this research study.

Paper selected from Primary Studies

In stage one, the inclusion of articles was done on the basis of following criteria:

<table>
<thead>
<tr>
<th>Paper selected from primary studies (first stage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

Table 3.2

Using the given criteria, we have found a range of 2000-3000 results within which we analyzed randomly of a value of 1% with closer links to the subject.
In stage two, the inclusion of articles was done on the basis of criteria mentioned above

<table>
<thead>
<tr>
<th>Title and abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Contains search words</td>
</tr>
<tr>
<td>• Focuses on the key words used for</td>
</tr>
<tr>
<td>search string</td>
</tr>
<tr>
<td>• Non duplicate</td>
</tr>
</tbody>
</table>

Table 3.3

By following the above mentioned criteria, we have included a total of 368 articles out of more than 900 based on title and abstract, with relevance of date.

In stage three, the inclusion of articles was done on the basis of criteria mentioned below in Table 3.5

**Step 3-(Paper selected from primary studies)**

<table>
<thead>
<tr>
<th>Introduction and conclusion</th>
<th>• Contains empirical background of the area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Mainly focus on e-government concepts and ideas</td>
</tr>
</tbody>
</table>

Table 3.4

By following the above mentioned criteria, we have found 46 articles out of 70 based on introduction and conclusion.

In the four and final stage, the inclusion of articles was done on the basis of criteria mentioned below

Stage 4 (Paper selected from primary studies)

<table>
<thead>
<tr>
<th>1</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Presence of empirical data in the paper</td>
</tr>
<tr>
<td></td>
<td>• Main focus on aspects, factors and elements of e-government</td>
</tr>
</tbody>
</table>

Table 3.5

**3.4m Data Synthesis**

Data synthesis is an important phase of systematic review which involves collecting and summarizing the results of the included primary studies (Kitchenham, 2004). In order to answer our research question, the raw data collected from the data extraction form were categorize and analysed. These raw data were tabulated and charted to present the differences and similarities of the selected primary studies.

**3.5 Reporting the Review**

The final phase of systematic review is reporting the systematic review results and spreading the results to potentially interested parties (Kitchenham, 2004). The main part of the present thesis research is devoted to report the systematic review, initiating from the planning phase till execution phase.
CHAPTER FOUR

4.0 Analysis of the Data Collected

4.1 Introduction

The underlining challenge of this thesis is the lack of information or very limited information of similar research with specific emphasis on Liberia, which makes it more difficult for comparison of findings with other research papers. Though there are similar papers on developing countries this is the only most likely source of comparison. These papers don’t have the same exact scope and objective as of this thesis. So far for Liberia, we have found only one paper by Eric Sirleaf 2010 which was a case study on the MOF ‘‘Evaluation of Information Communication Technology (ICT) services and Facilities at the Ministry of Finance’’ In addition to comparison of the findings by Eric Sirleaf 2010’s paper, we have selected two papers for analysis with our thesis. These are Research papers by Richard Heeks (2002); E- Government in Africa: Promise and Practice and Yayehyir Kitaw (2006); E-Government in Africa; Prospects, challenges and practices

Richard Heeks (2002) and Yayehyir Kitaw (2006) assert in their papers that challenges of establishing in e-government in developing countries are of slow pace and have greater challenges than developed countries. There are several underlining factors, including the poor existing telecommunication/ technological infrastructure in the developed countries unlike developing countries, the more democratic nature of governments in developed countries compare with more totalitarian regimes in developing countries with less incentive for openness’s and transparency. According to Averroy and Walsham (2000) _“successful implementation can be found….but frustrating stories of systems which failed are more frequent. In addition according to Heeks (2003) e-government implementation in developing countries failures is 35% being classified as total failure (e-government was not implemented or was immediately abandoned) and 50% as partial failures (implemented but there was undesirable outcomes) major goals were not attained or and there have been undesirable outcomes. Heeks further argues that the fundamental reason behind e-government failure in developing countries is as the result of what he referred to as the design reality gap (Heeks 2002; 2003). This indicates that the designed systems is not the replica of the required systems, a clear mismatch between what is designed and what should have been designed. Heeks 2002; 2003) argues that one of the strong reasons for E-government or IS implementation failure in developing countries is clear mismatch between the current reality and the design of the future e-government system. The chances of failure increase the gap grows. The mismatch could also be as the result of delayed implementation where requirement have changed or less understanding of users requirements by the developers of the system. If the time of collecting data on user’s requirement and the time of implementation are far apart, there is likelihood of disparity in the implemented system and the desired systems which may lead to abandonment of the system leading to failure.

Eric Sirleaf 2010, in his paper ‘‘Evaluation of Information Communication Technology (ICT) services and Facilities at the Ministry of Finance’’ assert that there are several challenges in implementing ICT in public sector in Liberia. His agreed challenges included the less existence of budgetary allocation for ICT, less capacity for ICT, low level infrastructure in place including telecommunication. However, Eric Sirleaf argues that his findings in the MOF included poor ICT infrastructure topology such as LAN, WAN connectivity, poor quality and delay in service delivery, The Lack of PABX SYSTEM to enhance internal communication to reduce cost, Poor supply of regular and stable electricity, lack of Backup system for business continuity, the absence of national backbone thereby leading to low bandwidth for staff to access full, Internet facility there also exists non intranet couple with internal official and standard email system for staff lack of trained manpower to maintain the system, lack of updated antivirus program for the system which also caused frequent breakdown, lack of a centralized stabilizer and UPS to support the power problem that exist at times. This thesis confirms some of the findings from Eric Sirleaf in his paper ‘‘Evaluation of Information
Communication Technology (ICT) services and Facilities at the Ministry of Finance. The thesis has a wider scope, than Eric Sirleaf’s case study. There are however several areas of agreement between the case study and the thesis, for instance

There were several sets of data collected during the period of data collection and research, including data from questionnaires, UN facts about E-government especially those related to Liberia, data gathered during face to face interview or telephone interview, data collected from the follow up letter sent for at least a page of personal perspective etc. This chapter is arguably the most challenging within the thesis, as the researcher is expected to make sense of the large amount of data collected, analyze the data with relation to the defacto Standards, Models and expectations of institutions like the UN, World bank in correlation to the universal standard of agreed concepts of E-Readiness of E-government. The main focus of the analysis was placed on the interview with senior management team members, the researcher also viewed questionnaires, there were 25 questionnaires received which represented a snapshot of total number of staff in the Ministry but provided a good representation of the views of the total number of staff members.

The data collected are several and each piece of the data contributed to understanding the research questions. The research took into consideration the principle of UN E-Government readiness index, UN e-government ranking of UN member countries. Data gathered from the survey are analyzed in graphical form using charts such a pie, bar charts in order to provide visual ease in interpretation of the results in line with the objectives of the research. The Evaluation of Information Communication Technology Services and Facilities in the Liberian Public Sector in an attempt to identify the e-readiness of the country is the objective of this study and is being achieved through extensive research conducted on the activities, faculties including human resources at the various ministries with specific focus on the Finance ministry.

4.2 Analysis of Data and Interpretation

We created questionnaire with predefined questions as presented in appendix c, with an objective to provide clarity and understanding of an existing ICT infrastructure structure and attributes in the various ministries. The data collected through the questionnaire served as an input to analyzing the environment. This analysis gives an indication of the challenges and prospects of establishing e-government in the various government entities.

The data in this survey were obtained from interviews conducted through the use of questionnaires, UN e-government related data such as e-readiness index of each UN member countries, interview conducted, data gathered from physical observation, data gathered from national budgetary Documents.

We distributed 100 questionnaires for the purpose of gathering data from respondents of the various entities. Our initial intention was to have a random selection of the questionnaires but this proved less effective as we felt that the results might not be a full and clear representation of the environment. The 50 questionnaire selected was on the basis of the fact that all different levels within the entities thus ensuring that all classes of staff members were represented in the analysis. We sorted the questionnaires to collect for senior managers (10 questionnaires), middle level managers (10 questionnaires), directors and alike (15 questionnaires and basic end users and others (15 questionnaires). We intend in our future research to do more in-depth study of the subject is hopefully doing our PhD study.

In our analysis we gathered facts on the following:

- Educational Background of employees
- Knowledge of the existence of LAN
- Computer usage Experience
- Knowledge of the existence of Servers
- Existing of ICT budget
- Existence of ICT department and staff
- Existing ICT infrastructure
- Level of knowledge on ICT by senior management and users
These data items are depicted as follows:

4.2a Educational Background of Staff

The data analyzed relation to the educational level of employees to be affected by computerization is analyzed in Figure 4.0 below.

These data items are depicted as follows:

Educational Background

![Educational levels of staff](image)

**Figure 4.0**

The human capacity index associated with the E-readiness concept is high in the ministries as all those who responded to the questionnaire were at least high school graduate with 25 percent Graduate Degree and Bachelor degree holders each. This implies that most of the staff members are ready for ICT training thus E-government per their existing academic status. Illiteracy is an impediment to e-government implementation.

4.2b Knowledge of existing of LAN

The data collected and analyze to identify the availability and staff knowledge of the computerized network such as LAN is depicted in Figure 4.1 below.

![LAN Knowledge](image)

**Figure 4.1**
There were 83 percent of respondents who agree that there is LAN in the place of work, this is only true for ministries of finance and planning and economic affair while 17 percent had no knowledge of LAN. This indicates few issues. From this reading it is realized that there is no centralized network environment in the ministry that is accessible by all staff members. Some sections of the ministry have access to Local Area network while others don’t even know if LAN exists.

4.2c Computer usage Experience

![Computer Usage Experience](image)

**Figure 4.2**

This data shows that almost all respondents have had at least one year working experience with computers. This is positive for process of E-government implementation. We see that 46 percent of the respondents has more than 6 years of usage experience with computers, 36 percent have 1 to five years work experience while 36 percent have 6-10 years of usage experience of computers. ICT training in this context will be facilitated more smoothly than in cases where people have had no computer usage experience.

4.2d Knowledge of Existing of Servers

![Awareness of Servers](image)

**Figure 4.3**

71 percent of the respondents were aware that MOF have servers while 29 percent was not aware of the existence of servers. This result is closely related to knowledge of existing of LAN, though peer to peer network have different attributes to the server based environment, with different implications. We believe that there prospects for E-government is increased positively since up to 71 percent are aware of servers therefore aware there existing of network environment. This implies that the users know the usage and implication of the servers in the ministries.
4.3 Presentation of Findings

Based on the analysis derived from the questionnaires, interview, observation, document analysis from government of Liberia, UN, World Bank, the study identified the below findings:

- There is no adequate ICT infrastructure in the various ministries, the ministry of finance has a more sophisticated ICT infrastructure than the rest, thought not adequate
- Lack of adequate disaster/backup and disaster recovery environment
- Challenges of having regular and adequate electricity
- High cost but limited Internet facility
- Though some of the ministries have LAN environment (though not adequate) there is no intranet, no internal official and standard email system for staff. Most use non-secured public email systems such as yahoo, gmail, hotmail etc.
- More training requirement especially for ICT professional
- Non-existence of legally acquired software for the ministries including standard Microsoft applications, antivirus etc. This is one of the most challenging bottlenecks.
- Less awareness given for budget and policy makers on ICT issues
- Adequate academic strength of staff members to get ICT knowledge
- Greater level of awareness of staff of benefits of computers and the Internet

As listed above, the findings are detailed below:

4.3a Inadequate ICT infrastructure

There is less adequate ICT infrastructure in the various ministries, though the finance ministry has a more sophisticated ICT infrastructure than the other three ministries, but inadequate. The ministry of finance has what may be referred to as “pockets” of ICT systems with less coordination and integration between the various systems including IFMIS, ASYCUDA, ITAS. The ministries of commerce and planning have no centralized ICT systems; though there are few non-networked computers with limited Internet access. This finding was derived from observation and interview with key staff members, sample transcript depicted in figure xy. The ministry of planning and economic affairs does not have centralized/domain environment but have networked of computers mainly for Internet access by users. Though some of the ministries have LAN environment (though not adequate) there is no intranet, no internal official and standard email system for staff members. Most use non-secured public email systems such as yahoo, gmail, hotmail etc.

4.3b Lack of adequate disaster/backup and disaster recovery environment

We gathered that the ministries of commerce, planning and economic affairs did not have any backup and disaster recovery for centralized filling systems. The absence of domain-based network made the issues of disaster and backup systems made a more difficult situation. With the non-coordination of systems in ministry of Finance, there is less backup and disaster recovery systems. Though each system including IFMIS, ASYCUDA, ITAS has separate backup mechanism in place.

4.3c Challenges of having regular and adequate electricity

The electricity in the various ministries was a challenge, as energy is costly to maintain. All the three ministries depended on generators for electricity or very expensive public power for energy generation.
Though the national electricity company has electricity, it is also a very costly adventure and sometimes unreliable. We gathered this fact from interview and daily observation of the various ministries.

4.3d **High cost and limited Internet facility**

The cost of Internet is very high with an average cost of $5000 per 1MB for a VSAT connection. The research shows that out of five ISPs in the country, each charge nothing less than $5000 USD for 1MB/month. This was observed to be a strain on government limited budget with long list of priorities. There were other alternatives for Internet connection like the CELLCOM Edge, LONESTAR MTN Edge; however these were only suitable for personal use. Our research actually shows that the limited Internet penetration is going to improve in the near future with the Fiber technology which is expected to come live by August 2012.

4.3e **More training requirement especially for ICT professional**

Our research confirms as depicted in figure 4.0 that staff members are academically ready ICT implementation, though we realized that more training is required to help provide greater awareness for e-government implementation both to staff and senior management. We gathered that there is no formal ICT training policy in place some of the ministries except for Finance Ministry that have in place IFMIS related training and some adhoc ICT training.

4.3f **Acquisition of Software**

Our research identified that more than 90% of software used on the ministries computers are not legally acquired. For instance the research could not indentified corporate licensed antivirus. Users either did not have antivirus, or used free versions of antivirus or depended on ICT staff for pirated antivirus. Out of the 25 computers that were randomly check for licensing requirement we have the below data in figure 4.5, which identify that most of the software were not acquired legally, average 80% of the various software were not legally acquired, while some users did not know how their software were acquired. We gathered that most users did not even know that software should be legally acquired under licensing agreement, this including managers.

<table>
<thead>
<tr>
<th></th>
<th>Yes (Number)</th>
<th>Percentage</th>
<th>no (Number)</th>
<th>Percentage</th>
<th>don't idea (Number)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Systems</td>
<td>2</td>
<td>8%</td>
<td>20</td>
<td>80%</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>Ms Office Application</td>
<td>2</td>
<td>8%</td>
<td>20</td>
<td>80%</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>4%</td>
<td>20</td>
<td>80%</td>
<td>4</td>
<td>16%</td>
</tr>
</tbody>
</table>

**Figure 4.5**

4.3g **Less awareness given for budget and policy makers on ICT issues**

The research revealed through interview and documentation there is less attention given to ICT budget partly because of less awareness of ICT issues by senior management.

4.3h **Adequate academic strength of staff members to get ICT knowledge**

As depicted in figures 4.0-4.2, the research concludes that there is adequate academic qualification and experience of each staff member to help implement ICT in the various ministries. What may be required is the improvement in ICT knowledge transfer to staff members. 25% of respondents have Master Degree, 25% have acquired Bachelor Degree, 30% are students at various universities at different levels.
4.3i Knowledge of the relevance of ICT to the business
The survey gathered that more than 45 persons-90% of those interviewed agreed that ICT will transform and greatly impact positively the workings of the ministries, 3, 6% said “not sure” while 2, 4% said “don’t know”. This result as depicted in figure 4.5 clearly suggest that there will be less resistance to the implementation of ICT as the users are aware that their work will be more effective and efficient by the introduction of ICT.

Figure 4.6

4.3j Usage of corporate email facility
The research identify that staff more often non corporate email systems. Out of the those interviewed 75% were not either not aware of the existence of corporate email facility or were too glue to public email systems such as yahoo, gmail etc. 20% either used the corporate or at least were aware that it exist, all those interviewed knew the functions of emails systems even if they did not use it.

4.3k The existence of ICT department and team
Our research identified that all three ministries have ICT department or its resemblance. Each ministry had a team of ICT staff. Out of the 40 persons interviewed 37 persons which nearly 93%, 3 persons which was 7% did not have any idea.
CHAPTER FIVE

5.0 Summary, Conclusion and Recommendations and Limitation of the Thesis

5.1 Summary

The Evaluation of Information Communication Technology Facilities and Services in the Liberian Public sector and the readiness of these public sectors towards the implementation of e-government is the main objective of this thesis. The ministries of Finance, Commerce, Planning and Economic Affairs were used as a case study in order to ascertain their readiness for the implementation of ICT in the transformation of their workings. Their selection was based on the relevance of these ministries to the governance process of this country especially the significance of the Ministry of Finance, which is one of largest employers of any government ministry. The expected impact of ICT implementation in the Ministry of Finance is huge with consequences expected to be wide range, this is because the Ministry of finance interacts with all government ministries and entities in the country and businesses. The Ministry of Finance is also the first government institution that has publicly announced the implementation of ICT systems including the IFMIS, ASYCUDA projects. The undue limitations in the technological capacities of the ICT systems of the public sector, coupled with slow paced of ICT introduction in the government, partly because of the ever increasing list of government priorities or non-prioritization of ICT were identified as the major problems this study intend to solve. As a means of rendering this study more meaningful, several fact finding methods were employed including questionnaire, observation, interview and the results identified that there are prospects of establishing e-government in the various ministries but with several challenges as identified in chapter four.

5.2 Conclusions

The objective of this chapter is to be able to make some comparison between the outcomes in this thesis and the outcomes by other research or academic papers. Our greatest challenge in working on this thesis is the non-availability of similar research already carried out before this for the purpose of comparing outcomes. We were able to find only two sources that have something loosely linked with the objective of this paper on Liberia. Eric Sirleaf 2010, in his case study on the MOF ‘Evaluation of Information Communication Technology (ICT) services and Facilities at the Ministry of Finance ‘and the UNPAN e-readiness data on Liberia as depicted in Appendix e. Though we agreed that the objectives of this thesis are not the same as these other works but they are the only available sources for comparison. We admit that this is one of the limitations of the thesis.

The thesis concludes that the ICT infrastructure in the ministries required great level of improvement as asserted by Eric Sirleaf asserts ‘Therefore, our evaluation has identified the limitation in the technological capabilities in ICT systems of the public sector, specifically the MOF the delay in real time and on-line processing of transaction, poor accountability leading to loss of GOL revenues and auditing purposes. The current ICT structure at the MOF is not sufficient and
its current system suffers from frequent breakdown, thereby leading to disruption of real-time processing, labor intensive and prone to errors and frauds. This study therefore seeks to evaluate ICT facilities, services and the maintenance of procedures at the MOF. ‘ Eric Sirleaf 2010. In addition, according the UNPAN e-readiness index (2010), Liberia was placed on the global scale 165, indicating a lower level position.

The conclusion provided as the result of this thesis, was derived after careful analysis of the data collected from the questionnaires, observations, ICT policy document, GOL web sites, interviews, UN sites associated with electronic government including UNPAN.

The thesis concludes that there prospects of establishing electronic government in Liberia in the various ministries is high and possible, but admit that the process is a daunting task that requires well-coordinated approach by several actors and resources. The government needs to prioritize ICT, improving ICT infrastructure through appropriate budget allotment in order to maintain and sustain the infrastructure by ensuring proper training for its staff members both ICT professional and the users. There needs to be a framework established towards e-government implementation. The prospects of implementing e-government are increased by the landing of the fiber optic in the country which is expected to give live by October 2012 (GOL 2012).

The landing of the fiber optic is a promising sound for the proliferation of the Internet in the country, the GSM companies are booming in the country, creating a good environment for competitive valued added services to customers. This helps to increase access to the Internet by Citizens as most of the GSM companies have mobile Internet services available either on the mobiles phones or mobile Modem-Internet equipment.

Making reference to the research questions identified in chapter one, we conclude the following as per the questions and answers.

Overall Research question 1: Identifying what are the obstacles and hinders for implementation of e-Government in developing countries.

Generally there are similar challenges and obstacles of implementing e-government in developing countries including Liberia. Lack of proper technological infrastructure, low literacy rate of citizens, non-democratic government and government reluctance for openness were all hindrances and challenges of implementing e-government.

Sub RQ 1: What is the level of readiness of Liberia for E-government implementation?
We concluded that the level of readiness of Liberia for e-government implementing is promising; the arrival of the fiber optic in the country for broadband connection is a promising track for the country. The fiber optical promises a faster and cheaper Internet Connection for the country.

Sub RQ 2: What roles can ICT play in the development agenda of Liberia in the PRS? ICT is a tool for poverty reduction, with ensuring effective and efficient operations thus reducing cost. ICT has proven record of reducing poverty.

Sub RQ 3: What are the ICT infrastructures and technical human resource capacity existing?
We conclude that the ICT infrastructure was not at appreciable status thus requiring a lot more investment and time for better improvement. The entities lack the required ICT infrastructures making them less ready for e-government implementation. Electricity is another challenge. Cost of computers and accessories are so high in the country.
We conclude also that the level of education of the staff members who were contacted were predominantly above senior secondary school, with others of Bachelor degree and Master Degree Sub RQ 4: Is there any ICT policy and/or how widespread is it implemented? We gathered that the government of Liberia has drafted and agreed on the ICT policy of the country with approval by cabinet for implementation. Though the implementation of the ICT policy is not widespread in the government entities and the level of awareness is poor.

Sub RQ 5: What is the level of resistance that might exist for e-government implementation? The thesis concludes that the level of resistance for the implementation of e-government is less. We gathered that most of those interviewed and data gathered from questionnaire were very enthusiastic about computerization and willing to embrace new technology.

5.3 Recommendations

- The ICT Policy has been approved by cabinet but implementation needs speeding up including greater awareness created of policy
- Passing of legislations for ICT introduction, implementation and usage
- Include ICT training in the curriculum both of secondary schools and tertiary institutions and provide scholarship for ICT studies abroad so as to increase professional ICT staff
- In order to improve access to ICT, the government needs to reduce tax drastically or waive taxes on ICT equipment and software; this will encourage businesses to import ICT materials in the country
- The government needs to priorities capacity building specifically for ICT professionals including the provision of scholarship. There is no university or college in the country carrying out ICT related programmes at degree levels
- Seek to improve the telecommunication infrastructure in the country, this looks promising with the landing of the fiber optic
- Put in place a policy oriented ICT training for all civil servants and enforce ICT training
- Increase awareness for policy makers on ICT issues including budgetary issues
- Better structuring of ICT professionals in terms of salary, positions and recognition by the government, so that government can be in the position to attract ICT professional for employment
- Ensure a national ICT agenda is implemented and driven with the recruitment of National ICT Coordinator
- The ministries should establish a single, centralized ICT department responsible for co-coordinating all ICT activities and systems
- Each ministry should have a web master whose function will be the ensure effective and efficient management of web site

5.4 Recommended e-government Implementation Model for Liberia

The thesis recommends the United Nations five stage model, United Nations (2001) with a focuses on web-based public service delivery. We believed that with the emerging support level of this government by the donor communities including the UN, World Bank, Africa Development Bank, IMF, the government of Liberia is likely to get support in its quest for the e-government implementation especially using a methodology approved by the UN.
The five stages are detailed as follows:
1. Emerging web presence
2. Enhanced web presence
3. Interactive web presence
4. Transactional web presence
5. Seamless/Networked web presence

**Emerging Web Presence:** The first stage of the UN’s five stage model—this is the initial stage where government websites provide mostly basic and limited static information with less options for citizens. This is simplest and less sophisticated stage of the model. Our research shows that the government has made tremendous work in establishing websites for several government ministries including the three under review of our thesis. The first stage has been achieved by all three entities.

**Enhanced Web presence:** This is the second stage, with improvement of government websites in terms of providing dynamic, specialized and regularly updated information for citizens and public access. Among the website features include search facilities, on-line help, and site maps. **Interactive Web Presence:** Users and service providers are connected to government portals (websites); Interaction became more sophisticated than in the former stage. Services such as search facilities and accessibility of various forms are enhanced. A lot of work needs to be done in order to achieve the enhanced web presence stage and stages below. There are very few attributes of existing websites that are dynamic, specialized and regularly updated information for citizens and public access.

**Transactional Web Presence:** This stage allows two-way interactions between the citizen and the government; users can conduct complete on-line transaction including buying and selling activities. We identify no evidence of this the government entities providing any facility that permits two way communications online.

**Seamless/Network Web Presence:** This is the most sophisticated level of e-government service delivery; all services and functions across all government levels, sections and departments are integrated; citizens can access any kind of services from a central location known as Portal at any given time. The government of Liberia needs to do more in achieving this stage including the development of capacity of ICT professionals, improve the ICT skills of the civil servants and the public, with greater level of awareness, coordination between entities.
6.0 Limitation of the Thesis

Chapter Six

As we are at the end of the thesis, this chapter gives a brief overview of challenges and limitations of
the thesis. There were several challenges and limitations associated with the thesis
development. We encountered the extreme limitation of access to data; the gathering of data from the
various entities was marred by difficulty. We encountered staff members who were not ready to provide
information either because they claimed they had no time or were worried of the possible consequences
of providing data. The government is a plaque with of secrecy as such gathering data is a real challenge.
The absence of information in this case required a great deal of ingenuity, sometimes there was no
option but subjectivity for the data collection.
Another very serious challenge is the absence of similar research papers for the purpose of comprising
the result of the thesis to this similar work. We therefore did not have the option to compare our
research work with other published work except for the papers by Eric Sirleaf Richard Heeks (2002); E-
Government in Africa: Promise and Practice and YayehyirKitaw; E- Government in Africa; Prospects,
challenges and practices though these papers don't have the same and exact scope and objective as of
this thesis. These limitations create the requirement for further research in the area. My hope for the
future during my PhD is to carry out a deeper research in the research area of e-government for
developing countries which will provide far greater understanding than this thesis.
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APPENDICES
This section gathers the appendices referenced in the body of the thesis, serving as a supplementary material for the thesis.

Appendix (A)
Appendix (A) content is sample script of the letter sent to few number of staff members which sought to unravel the personnel opinions, perception, and challenges of establishing E-government at the ministries by the staff members.

Dear Sir/Madam,
Request for personnel opinions, perception, and challenges of establishing E-government
As per the attached letter of introduction, I am reading Msc. Informatics at the Blekinge Institute of Technology-Sweden (Online). As part of the programme I am expected to fulfil a thesis.

My approved thesis is titled “the prospects and challenges of establishing E-government at the Ministry of Finance”. I humbly request your support in fulfilling this project by providing me your personnel perspectives on the possibility, challenges, risks, constraints etc of transforming the ministry of finance ways of work using ICT thus creating an E-government environment.

I will appreciate if you can kindly share with me using atleast a page detailing your personnel opinions, perception, and challenges of establishing E-government in your ministry.

Sample script from staff:

Staff Identify: Staff 01
Dear Mr. Kamara, this is my response as per your request:

I have worked with the ministry for nearly five years. During this period we have seen lot of changes as far as technology is concern. When I joined we did not have Internet, there were very few computers, and there was no ICT department providing us support. All these have changed over the years. The number of computers in the ministry has rising to more than forty with some having access to the Internet. The ICT department has a team of five persons providing technical support. I will think that there will be less difficulty in introducing computers and the Internet in the ministry thus e-government, I believe staff members will be happy and support it. Though I believe a lot more awareness have to be done since the implementation of e-government is going to change entirely the way business is performed.

Some of the challenges or obstacles I envisaged include the lack of sufficient funding/budget towards ICT as we often heard from ICT staff. The acquisition of software legally, we understand most of our software are not acquired legally as they are pirated. There needs to be more formal computer training for the ministry ensuring all staff members are trained to use computers effectively and efficiently.

I hope this information will help you in achieving your objectives set in your thesis

Appendix (B)
Appendix B is the brief request and questionnaire used for the purpose of collecting data to inform
the thesis.

Dear Sir/Madam,

REQUEST FOR QUESTIONNAIRE FILING

I humbly request your participation in filing the below questionnaires in fulfilment of the Msc. Informatics Programme with Blekinge Institute of Technology-Sweden. Please find attached the letter of introduction from the University.

I am writing THESIS ON ‘LIBERIA READINESS FOR E-GOVERNMENT WITH FOCUS ON THREE KEY GOVERNMENT MINISTRIES:

- MINISTRY OF FINANCE
- MINISTRY OF COMMERCE
- MINISTRY OF PLANNING AND ECONOMIC AFFAIRS

The aim of questionnaire is to gather data on concept of ICT and E-government, to ascertain how Liberia is ready for E-government implementation.

Please be assured that the questionnaire is purely for academic purposes, be assured of confidentiality. No name of respondent is required to assure anonymity.

Thanks for your time in responding, I am much grateful. INSTRUCTION:

1) The questionnaire contains 15 questions, most of which require yes/no answer with requiring explanation

2) Upon completion: (a) you may please hand over to the focal person who gave you the questionnaire, or (b) you may attach and mail upon completion to Lkamara68@gmail.com or (c) I can collect it from you

BIO-DATA

Sex:

Date of Birth:

Educational Level: 1) High School 2) Vocational Training
3) BSc/BBA Degree  4) Master Degree  5) PhD

Other; Specify .................................. Years of Experience with computer usage:

1) Does the ministry have computer network??

YES (1)  NO (2)

2) Does the ministry have servers?

YES (1)  NO (2)

3) Does the ministry have internal email system?

YES (1)  NO (2)

4) Does the ministry have IT Department?

YES (1)  NO (2)

If question 4 is yes, please answer 5 else please skip to go to Question 7,

5) How many IT Staff are in the IT Department

………………………………

1-10(1)  11-20(2)  above 21(3)

6) Does the ministry have ICT Policy in placed?

YES (1)  NO (2)

7) Does the ministry have ICT Budget?

YES (1)  NO (2)

If no please skip to question 10 else go to question 9

9) Is the budget considered sufficient?

YES (1)  NO (2)  NO IDEA (3)

10) Does the ministry have web site?

YES (1)  NO (2)  NO IDEA
If yes, please give web site address: ............................................................

11) Is the web site updated frequently?
   YES (1)   NO (2)

12) Does the ministry have Internet access?
   YES (1)   NO (2)

If Question 12 is yes, please go to question 13 else go to question 14

13) What type of connection is the Internet access?
   VSAT     GSM MODEM    Others (Specify).................................

14) Is there any control mechanism for the Internet?
   Yes (1)   No (2)

15) Are you aware of the E-Government Concept?
   YES (1)   NO (2)

15) Do you predict any resistance to computerization of your organizational procedures by staff?
   YES (1)   NO (2)

16) Do you believe computerization have benefits for your organization and staff?
   YES (1)   NO (2)   NOT SURE (3)
17) What is the estimate member of staff in the ministry?

1-100 101-500 Above 500

18) What is the estimate number of computers in the ministry or your section?

1-100 101-500 Above 500 Section or Ministry? ……………

19) Does the ministry have any computer training package for staff members?

YES(1) NO(2) NOT SUFFICIENT ()

20) Are your computer software acquired legally from the vendor?

YES(1) NO (2) NO IDEA

21: Please explain how your work interacts with the other ministries:

THANKS SO MUCH FOR YOU TIME (Lkamara68@gmail.com, 0886581242)
To whomsoever it may concern,

This is a letter of introduction, which offers information about how we recommend that our Master students at Blekinge Institute of Technology perform field studies to provide an empirical base for their master thesis at Blekinge Institute of Technology, Sweden.

Students who are studying for their Master's Degree in Informatics at Blekinge Institute of Technology are required to perform individual research project as the final stage of their advanced education program. This project includes both literature studies and field studies, and results in a written Master’s Thesis. It is important for students of informatics to gain access to "real world" experiences of information and communication technologies (ICT) in use.

During their studies, we encourage them to challenge the theories they learn about, based on their own experience and what they see in their own context. It is through a constructively critical approach and the ensuing intelligent dialectics between theory and practice that we believe they can learn the most valuable lessons about how to design useful technologies for the future.

Students are encouraged to carry out interviews, observations and other forms of field studies whenever this is possible. In presenting empirical material and results, the informants are always made anonymous to the readers. The students are recommended to let informants read their thesis before it is finally published, whenever this is possible, and informants are given the final say about what they agree may be published in the master thesis, based on information they have given during interviews.

We sincerely hope that you are able and willing to contribute to the work of our Master students by giving them access to your work life experience within the topic they have chosen to write about, and thank you in advance for taking the time to make this contribution.

Karlskrona June 24th 2010

Sara Eriksen
Professor of Human Work Science and Informatics
Head of the Master of Informatics Programmes (1 year and 2 years) School of Computing
Blekinge Institute of Technology e-mail: sara.eriksen@bth.se
home page: www.bth.se/iaw
Appendix (c)

Appendix c detail a sample script of the face to face interview conducted with some key staff

Name: Name withheld
Position/Job Title: ICT Specialist
Ministry: Finance Ministry
Department/Section: ICT
Gender: Male

Questions

**Question 1:** how long have you worked with the ministry? Answer: 5 years

**Question 2:** Do you have adequate budget for ICT?
Answer: We have lot of challenges as far as budget is concern, there are lot times we cannot get what we want as a department. We are always told that there is no money, this leads to inefficient systems. We don't even have for instance UPS on some computers. We don't have legally acquired software including antivirus because of the lack of money.

**Question 3:** is it possible for the implementation of e-government in the ministry?
Answer: I think it is possible for the implementation of e-government in the ministry provided lot to things change. We need to have more recognition from senior management so as to change the position of ICT in the ministry.

**Question 4:** Please describe for me briefly your computerised systems in the ministry
Answer: We actually have lot of computers in the building but not all are networked, some department or section has their own network sharing resources, these sections or department sometimes have their own ICT team. We have several independent applications including ITAS, IFMIS, and ASYCUDA but there is no coordination or interaction between their individual systems.

**Question 5:** what do you think will be single most challenge in implementing e-government in the ministry?
Answer: I think the resistance to change especially by senior management is the single challenge in the implementation of e-government in the ministry. I think the senior management team members are not ready for full ICT implementation.

**Question 6:** do you have anything you want to share with me that I have not asked you. Thanks for your time
Appendix (d)

Details collected during the observation

As part of the data collection process, we employed observation as another means of identifying the structure and status of the ICT environment, the observation also included questioning where necessary.

The analysis of the observation is that all ministries except for Commerce have LAN and the Internet but not all users are on the Internet, the Internet is costly, electricity is not adequate for effective ICT environment. We observed that the ministries have budget on ICT but it was clear that the budget was not adequate. The licensing requirement was another observation that computers in the ministries were not running on licensed software.

Date: June 2011; Duration: 3 hours

Ministry/Department: Finance Ministry

1. Number of computers: (A) 0-10, (B) 10-50 (C) 50>
2. Network Exist: (A) No (B) YES
3. Domain or Peer to Peer (A) Domain (B) Peer to Peer
4. Existence of Web site: (A) Yes (B) No
5. Frequency of web site updates: (A) weekly (B) Monthly (C) Not frequently
7. Existence of ICT Department (A) Yes (B) No
8. Existence of ICT Budget (A) Yes (B)
9. Software licensing requirement (A) Yes (B) No
10. Adequate electricity (A) Yes (B) No
11. Internal telephone systems (PABX) (A) Yes (B) No
12. Existence of Internet (A) Yes (B) No........The Internet is very costly and not accessible by all staff members in the office (monthly fees for 512/512 is $6000)

Date: June 2011; Duration: 2 hours

Ministry/Department: Planning and Economic Affairs

1. Number of computers: (A) 0-10, (B) 10-50 (C) 50>
2. Network Exist:  (A) No  (B) YES
3. Domain or Peer to Peer  (A) Domain  (B) Peer to Peer
4. Existence of Web site: (A) Yes  (B) No
5. Frequency of web site updates: (A) weekly  (B) Monthly  (C) Not frequently
7. Existence of ICT Department (A) Yes  (B) No
8. Existence of ICT Budget  (A) Yes  (B)
9. Software licensing requirement (A) Yes  (B) No
10. Adequate electricity (A) Yes  (B) No
11. Internal telephone systems (PABX)  (A) Yes  (B) No
12. Existence of Internet  (A) Yes  (B) No........The Internet is very costly and not accessible by all staff members in the office (monthly fees for 512/512 is $6000)

Date: June 2011: Duration: 2 hours

Ministry/Department: Ministry of Commerce

1. Number of computers:  (A) 0-10,  (B) 10-50  (C) 50+
2. Network Exist:  (A) No  (B) YES
3. Domain or Peer to Peer  (A) Domain  (B) Peer to Peer
4. Existence of Web site: (A) Yes  (B) No
5. Frequency of web site updates: (A) not applicable
6. Web address: Not applicable
7. Existence of ICT Department (A) Yes  (B) No
8. Existence of ICT Budget  (A) Yes  (B) No
9. Software licensing requirement (A) Yes CID No

10. Adequate electricity (A) Yes CB) No

11. Internal telephone systems (PABX) (A) Yes CID No

12. Existence of Internet CA) Yes (B) No.......The Internet is very costly and not accessible by all staff members in the office (monthly fees for 512/512 is $6000)
Appendix (e)

Appendix e is a detail of extract of data on Liberia e-readiness by relevant institution such as the ITU, UN.

Summary on Liberia as per

E-Readiness Survey 2010 by UN-Liberia’s Position
Facts about Liberia (courtesy: http://www.bbc.co.uk/news/world-africa-13729505

- **Full name**: Republic of Liberia
- **Population**: 4.1 million (UN, 2010)
- **Capital**: Monrovia
- **Area**: 99,067 sq km (38,250 sq miles)
- **Languages**: English, 29 African languages belonging to the Mande, Kwa or Mel linguistic groups
- **Major religions**: Christianity, Islam, indigenous beliefs
- **Life expectancy**: 59 years (men), 61 years (women) (UN)
- **Monetary unit**: 1 Liberian dollar (L$) = 100 cents
- **Main exports**: Diamonds, iron ore, rubber, timber, coffee, cocoa
- **GNI per capita**: US $160 (World Bank, 2009)
- **Internet domain**: .lr
- **International dialling code**: +231
- **UN 2010 E-readiness Index**: 166

This section of the thesis presents the UN E-readiness position of the Liberia for the UN E-Readiness 2010 (Richard Kerby, 2010; UN.org). Because of the many years of civil war, there have been no reliable data on Liberia readiness for E-government.

The rational of the 2010 E-government survey took into consideration some factors as outline below:

- The global Economic Crisis. This crisis created what could be considered confidence crisis between citizens and governments. UN in this survey decided to bring in the factor of how governments are making use of ICT to provide required information, services and solutions to their citizens. This confidence issues between citizens and government could be a hindrances for any improvement in relation thereby frustrating the process of E-government implementations.
- The 2010 survey was a comparative assessment of 192 United Nations Members State's response to the demands of citizens for excellent services and products through ICT.
- 2010 questionnaire looked closely at the impact of E-participation on citizens on citizens engagement
- It also greater importance to integrated services that facilitated citizens ability to access information and products
- The questions were more granular and specific in detailing the type of e-services and e-participation that countries provided their citizens
UN E-government's expected citizens to government relationship

Citizens Desires
- Mobility
- Trust in Government
- Inclusiveness
- Usable data
- E-participation
- Secure Networks
- Single Sign-on
- Social Networking
- Citizen-centered Content
- Voice in determining government policies

Government Responsibility
- Accessibility
- Increase Broadband PC and Mobile Infrastructure
- Greater use of Web 2.0 and SocialNetworking
- Integrated services
- Business Reengineering and streamline workflow processes
- Secure Network
- Enhanced PC and Mobile
- Content
- Authentication of user

Outputs

Courtesy: UNPAN.org

In keeping with the conceptual framework of the sustainable human development, the following selected ministries were reviewed:
- Ministry of Finance
- Ministry of Education
- Ministry of Health
- Ministry of Labour
- Ministry of Health and Social Welfare

Using the UN Telecommunications Infrastructure Index (UN; August 2009), Liberia was ranked as follows:

<table>
<thead>
<tr>
<th>Infrastructure Index Data</th>
<th>Country</th>
<th>Internet Users</th>
<th>Mobile</th>
<th>Fixed Lines</th>
<th>Pes</th>
<th>Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberia</td>
<td>0.55</td>
<td>19.30</td>
<td>0.06</td>
<td>.</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Courtesy: ITU data as of August 2009

Human Capital Index
As previously stated above, the human capital index is defined by the UN as the composite of the adult literacy rate and the combined primary, secondary, and tertiary gross enrolment ratio, with two thirds weight given to the adult literacy rate. The gross enrolment ratio was drawn primarily
from the United Nations Educational, Scientific and Cultural Organisation (UNESCO). This was complemented with data from the 2009 UNDP Human Development Report.

<table>
<thead>
<tr>
<th>Country</th>
<th>Adult Literacy</th>
<th>Gross Enrolment</th>
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</thead>
<tbody>
<tr>
<td>Liberia</td>
<td>55.5</td>
<td>57.64</td>
</tr>
</tbody>
</table>

Courtesy: ITU data as of August 2009

This section provides information on existing data collected from UN survey 2010, (E-readiness Survey)

**Courtesy: UNPAN.ORG**

---

**World Rankings**

**Regional Average of e-Government Survey**

![Bar chart showing regional averages of e-Government Survey](chart)

**Courtesy: UNPAN.ORG**
## Regional Rankings - Africa

**Regional Average of e-Government Survey**

![Bar chart showing regional e-Government rankings](chart.png)

### Courtesy: UNPAN.ORG

## Regional Rankings – West Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>2010 Index</th>
<th>2008 Index</th>
<th>2010 Ranking</th>
<th>2008 Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Verde</td>
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<td>Ghana</td>
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<td>0.2997</td>
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<td>Cote d'Ivoire</td>
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<td>0.3063</td>
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<td>Senegal</td>
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<td>Togo</td>
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<td>0.2191</td>
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<td>160</td>
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<td>Liberia</td>
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<td>0.2179</td>
<td>165</td>
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Liberia's Global Rankings

E-government development index

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<th>Year</th>
<th>Index Value</th>
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2010 E-government Development Index

Online service index

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Telecommunication

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Human capital index

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E-participation index

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Liberia's 2010 Ranking

8
West Africa

41
Africa

166
Global

30
Least Developed Countries

163
Online Service Index

Courtesy: UNPAN.ORG
## Liberia’s Ranking – Portal and Ministries

### 2010 website survey outcome

<table>
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<tr>
<th>Website</th>
<th>Points for emerging information services</th>
<th>Points for enhanced information services</th>
<th>Points for transaction services</th>
<th>Points for connected approach</th>
<th>Total</th>
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<td>0</td>
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<table>
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<th>Website</th>
<th>Points for emerging information services</th>
<th>Points for enhanced information services</th>
<th>Points for transaction services</th>
<th>Points for connected approach</th>
<th>Total</th>
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<tbody>
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<td>11</td>
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Courtesy: UNPAN.ORG