

A SYSTEMATIC APPROACH TO DESIGNING AND IMPLEMENTING E-GOVERNMENT SYSTEMS IN THE DEVELOPING WORLD

by

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Declaration

I Emmanuel Eilu do hereby declare that this Dissertation is original and has not been published and/or submitted for any other degree award to any other University before.

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Dedication

First and foremost, I dedicate this work to the Almighty God, through his son Jesus Christ. Then to my wife Mrs. Theresa Eilu, my mother Sr. Jennifer Eilu, my father Mr. Peter. C. Eilu, my elder brother Denis Paul Oryiekot, my sister Catherine Opule and her husband Emmanuel Opule, to my young cousin Apolot Eveline. May the favour and the blessing of the Almighty God be with you all.

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List of Acronyms

ASP	Application Service Provider
BSNL	Bharat Sanchar Nigam Limited
CCL	Common Command Language
C-DIT	Center for Development of Imaging Technology
CIO	Chief Information Officer
DBC	Danish Library Center
DIO	District Informatics Officer
ETC	And so on
FAQS	Frequently Asked Questions
GIS	Geographic Information System
GOAP	Government Of Andra Pradesh
ICT	Information Communication Technology
ICR	Intelligent Character Recognition or Image Character Recognition
IT	Information Technology
IMEI	International Mobile Equipment Technology
MIS	Management Information System
NIC	National Informatics Center
NIC	National Informatics Officer
PDF	Portable Document Format
PPP	Public Private Partnership
PVT	Private
RDBMS	Rationale Data Base Management System
RFP	Request For Proposals
RS	Rupees
RTCS	Real Time Computer System
SITA	State Information Technology Agency
SQL	Sequence Query Language
SSL	Secure Socket Layer
TCP/IT	Transfer Control Protocol/Internet Protocol
TSP	Total Solution Providers
VIPS	Virtual Internet Protocol System
XML	Extensible Markup Language

Abstract

With the widespread deployment of e-government systems in developing countries, and as well as the high failure rates, it is important to understand the complex processes that underlie successful design and implementations of large-scale e-government systems. This dissertation therefore was motivated by a desire to leverage e-government lessons already learnt in the developing world to maximize the chances of success for future e-government projects. A number of successful and unsuccessful ICT projects were critically studied. This dissertation looks at how these projects were designed and implemented (planning, development, communication, integration and management). The study therefore developed a systematic approach for designing and implementing e-government in the developing world. The study realised that it is important to have a nuanced reading of stake holders in the e-government systems domain to understand the origin of conflict and resistance to such systems. Funding from the government and other stake holders is highly essential. Sensitisation of all the stake holders and especially the users is inevitable. Corruption and bribery, resistance to the system, lack of trained staff, lack of trust in the system and lack of political will/interest were seen by the research as the greatest challenges faced during the design and implementation of e-government in the developing world. The practice of "*cut*" from Europe and "*paste*" in the developing world must be avoided because these are two different worlds.

Chapter 1

INTRODUCTION

1.1 Background

There is no doubt that the digital revolution which has its roots in the developed world is spreading hastily across the developing world. This is evidenced by numerous Internet cafes in every urban setting, schools/institutions, public libraries, coffee shops and hotels. The private sector has taken the advantage of this digital revolution to improve on its services. Banks are setting up Automated Teller Machines (ATM) even in rural areas, goods and services can be bought over the Internet and digital devices (iPods, DVDs, digital cameras) are being sold everywhere including the rural areas in developing countries

Governments, bowed by the pressure to improve its services to the citizens, have recognized the value of ICTs and have join the private sector in the digital revolution. Ndou (2004, p.7) confirms that *"recognizing the power of ICTs, many developing countries, assisted by international organizations for development, have started building and encouraging e-strategies and initiatives to address a wide range of economic, social, technological, infrastructural, legal and educational issues"*. It is true that the use of ICTs in the developing world is at its infant stage. Schwere and Deane (2003) confirm that several developing economies are in the preliminary chapters of implementing electronic government (e-government) programs in order to provide better public services. Now, for the few developing countries that have tried adopting e-government, it has remained deficient over years. Most e-government projects that are introduced in the public sectors mainly end in either partial or total failure. Investigation and poll results approximate that 35 percent of e-government projects in Africa totally

fail, 50 percent partially fail and only 15 percent achieve all the intended goals and objectives (Heeks, 2003) . This massive failure usually arises-because e-government ideas and designs originate from western Europe, origins that are considerably different from African realities. Therefore a systematic approach designed to suite the developing world is lacking. These large '*design-reality gaps*' as Heeks (2003, p.2) adds-can also be seen to underlie failure.

A number of scholars have undertaken research on e-government and have come up with frameworks that could be adopted for a successful e-government project.

Kreizman and Fraga (2003, P.1- 6) in their framework for a successful e-government project emphasised on approaching e-government holistically, sharing services, developing specific e-government policies, instituting a governance process, prioritizing and authorizing, addressing privacy and security issues and developing a unified marketing brand.

Ndou (2004) in her framework elaborated on e-readiness assessment, raise awareness among public and private organizations, pilot schemes, collaboration and coordination, human development, sensitivity, holistic approach and knowledge management and change.

The national e-government framework of Uganda and the East African regional e-government framework shared the same issues in policy formulation, human resource development, co-ordination, monitoring and evaluation (EACS 2005, NICTPF, 2003).

Its important to note that there are serious challenges that many e-government projects in the developing world face. In most cases, it is evident that developing countries lack IT infrastructure, if the infrastructure is available, then it is defunct. Yet this is the most fundamental aspect for e-government. As Wegner *et al.*, (2003) points out that for any e-government project to start, there must be an available infrastructure, the government must make sure that it has the necessary IT facility that is able to support and enable the execution of e-government.

There is also a challenge in understanding what e-government is all about. In most developing countries, e-government is all about computers used in public service. "*These narrow ways of defining and conceptualizing e-government restrict the range of opportunities it offers. One of the reasons why many e-government initiatives fail is related to the narrow definition and poor understanding of the e-government concept, processes and functions,*" as asserted

by (Ndou, 2004, P.3) .

1.2 Statement of the Problem

E-government brings with it the promise of greater efficiency and effectiveness of public sector operations. For this reason, an increasing number of e-government projects are being implemented world wide. However, behind these multi million dollar projects, lies a bitter reality. Reports generated from fourty e-government cases in the transitional and developing countries estimate that only fifteen percent of these e-government projects end up successful. These malfunctions come at a high cost for the world's deprived economies like Uganda (Heeks, 2003). The problem is lack of an accepted and satisfactory systematic approach detailing what should be included in the design and implementation stages of a successful e-government initiative. Therefore, this research will propose a systematic approach to help design and implement a successful e-government project in the developing world.

1.3 Objectives

1.3.1 General Objective

The main objective of this research was to propose a systematic approach for designing and implementing e-government projects in the developing world.

1.3.2 Specific Objectives

1. To identify key success and failure factors for selected e-government projects and discussing the benefits of e-government compared to traditional methods of providing public services.
2. To ascertain challenges faced during the adoption of e-government systems in the developing world.
3. To propose a systematic approach for designing and implementing an e-government project in the developing world.

4. To validate the proposed systematic approach for designing and implementing an e-government project in the developing world.

1.4 Research Questions

While carrying out the research, the researcher developed guiding questions like:

1. What is e-government?
2. What are the existing e-government frameworks and what are some of the loopholes in these frameworks?
3. How is the structure of a successful e-government project?
4. What factors are responsible for the success and failure of an e-government project.
5. Given the high cost generally required by e-government, is it worthy for the governments in the developing world to launch more e-government projects? what are the benefits?.

1.5 Significance/Justifications of the Study

From the time when the information revolution began, additional public agencies have taken on an e-government approach in order to obtain benefits of the new opening brought in by new information and communication technologies (Heeks, 2003). Since most developing countries are adopting e-government (Uganda inclusive), this research therefore has sought, among others things to design a systematic approach on e-government adoption, this information is useful to any government department seeking to undertake an e-government project, it provides a systematic approach on the design and implementation of an e-government projects hence a voiding total or minimizing partial failure of any project undertaken.

The research also helps in laying the foundation for advocating and promoting of e-government and hence developing an understanding of e-government as an important tool for the provi-

sion of government services to the masses and also improve on citizen participation in public affairs.

1.6 The Scope of the Study

The study has focused on critically analysing data collected from three projects in Uganda, three from India two from Europe (Denmark and Finland respectively for comparison purposes), one case from Mozambique and South Africa respectively. The research was centered on documenting what is known about e-government to date, critically analyzing and evaluating success and failure cases in the developed and developing countries and organizing knowledge to reveal trends and pointers for a systematic approach suitable for a developing country like Uganda.

Chapter 2

LITERATURE REVIEW

This chapter provides literature about e-government and particularly looks at the phases and the role of e-government to the government, citizens, business and to the employees. It also looks at the challenges and different frameworks of e-government.

2.1 Introduction

The use of computer and communication technologies in the public administration can be traced way back to early 1950s. The universal automatic computer built by Presper was the first payroll computer to be used for paying civil servants in the U.S and it was used by the U.S. census department in 1954. Ever since that time, the use of computer in government department spread like wild fire (Zhou, 2004).

Numerous scholars have advanced a number of different e-government definitions. This has helped this research answer the first research question (i.e what is e-government). Different interpretations of e-government have been advance by different scholars- some reckoning that e-government is "*digital governmental information*" (Ndou, 2004, p.3). Tapscott, (1996) as quoted by Ndou (2004, p.4)- defined e-government as "*an Internet-worked government which links new technology with legal systems internally and in turn links such government information infrastructure externally with everything digital and with everybody*". Fraga (2001) also cited in Ndou (2004) claims that e-government is a sort of make over or revolution of government parastotals and departments using digital technology. This in-turn would

improve the relationship between government and its citizens. An e-government initiative is a very complicated process which calls for a wider and broader understanding on what it entails. Tapscott (1996) and Fraga (2001) basically limited e-government to the Internet and digital technology yet e-government is more than the Internet and new technologies. The Internet and its technologies are a small fraction that make up e-government. The importance of the Internet and ICTs in government is not ignore but its important to realised that these technologies are just a subset of the bigger e-government picture and failure to realize this always leads to e-government failure (Riley, 2004).

The most appropriate definition of e-government was forwarded by Jeffrey (2001) who puts it more broadly and talks about e-government as "*smarter government*" - one that makes the best use of new information, communication and social technologies to empower the public service of the future

2.2 Phases of e-government

E-government is an evolutionary process that involves a number of stages or phase. Each individual developing country has it own stage of development. Most developing countries are in the first and second stage with few interactive services to their citizens. Countries which were at the emerging stage (first stage) in Africa included Botswana, Malawi, Lesotho, Angola, Ethiopia, and Gambia to mention but a few. The second stage called the enhanced stage has 16 countries and they include Kenya, Namibia, Tanzania, Zimbabwe, Zambia, and Uganda (Wagner *et al.*, 2003 and Mutula, 2005).

Other phases include, the interaction phase which is the third stage boasts of only four countries in Africa and they include, South Africa, Mauritius, Morocco, and Egypt. Then transactional and transformation are the fourth and fifth phases of e-government. Most developed countries are in these stages (Mutula, 2005). It should be noted that e-government is not a one-step process or implemented as a single project. It is evolutionary in nature, as Tapscott (1998) quoted in Wagner *et al.*, (2003, p.2) identifies it as "*an evolution sequence*" involving multiple stages or phases of development.

2.3 Barriers and challenges of e-government

"Many e-government initiatives are in their strategic phase of implementation (infancy), however, some key problems and barriers are already beginning to emerge. There are a number of barriers experienced in public sector organizations that prevent the realization of anticipated benefits and degrade successful adoption of e-government projects" says (Ebrahim and Irani 2005, p.601). The challenges of adopting e-government in developing countries are numerous and these challenges arise as a result of multidimensionality and complexity of government initiatives in these developing countries, as the results can be seen through massive failure of most e-government projects (Ndou, 2004).

2.3.1 ICT Infrastructure

Ndou (2004, p.13) reveal as she quotes from (Tapscott, 1996) that *"ICT infrastructure is recognized to be one of the main challenges for e-government. Many developing countries suffer from the digital divide, and they are not able to deploy the appropriate ICT infrastructure for e-government deployment"*. It is evident that in most developing countries, the available infrastructure that could be used to adopt e-government dates back to the colonial era and are either outdated and can not cope up with that latest technology or it is defunct. Most public offices do not have computer and a few that have, do have outdated computers, yet ICT infrastructure is very paramount if e-government is to be adopted. Therefore the upgrading and development of basic ICT infrastructure in the developing world would capture the advantages of new technologies and communications tools which are very significant for undertaking an e-government initiative (Ndou, 2004) . However, developing and upgrading the basic ICT infrastructure does not guarantee success, the initiative must have enough resources including skilled manpower (Ebrahim and Irani, 2005).

2.3.2 Policy issues

There is no way e-government will succeed if there are no strong ICT laws and policies enacted by government. Although other rules, polices, laws and legislations are well established in the developed world, developing countries have not yet strengthened the laws and polices

on ICT. The achievement of e-government initiatives and processes are highly reliant on governments responsibility in making an effort to adopt a proper permissible framework for an e-government process. E-government can only be achieved when the legal laws on adoption of digital technology is strengthened (Lau, 2003) . For an e-government initiative to success there must be a wide range of rules and polices that govern e-government aspects like e- signatures, Internet usage, data security, crackers, copyrights etc (Ndou, 2004).

2.3.3 Human capital development and life long learning

The key challenge for an e-government initiative especially in the developing world is the chronic deficiency in digital experts in government. The ICT illiteracy rates in most developing countries is generally high. The ratio of a computer to citizen in the developing world is very high and this has left a large proportion of the population as computer illiterates, yet e-government requires highly skilled manpower in its various aspects like developing and instalation of the ICT infrastructure, maintenance, using and managing the system (Ndou, 2004). Moon (2002) as cited by Ebrahim and Irani (2005) concluded that in order to have a successful e-government implementation, government departments and ministries will have to drift towards a more higher level of e-government development, and this requires more highly skilled technical staff and a relatively literate masses .

2.3.4 Change management

The employee struggle to strangle the digital office in fear of loosing his or her job is yet one of the biggest challenges faced by digital offices (Ndou, 2004). Digital technology divides, it divides peoples who use ICTs and originate from the digital era and those who do not use technology and did not originate in the Internet age(older generation), therefore there is always a challenge of making the citizens cope up with the latest technology because employees who did not originate from the digital era fear change because in the world over, technology has replaced manpower especially the unskilled labour and this has been the greatest fear for employees (Ndou, 2004 and Riley, 2004).

2.3.5 Partnership and collaboration

Since developing countries are at the infant stage of e-government, they have not realised the significance of collaboration, yet collaboration among stake holder is very vital for the success of any e-government project, stake holders in the ICT sector do not operate in isolation because this will lead to duplication and interoperability (Lau, 2003). Although collaboration and cooperation are not easy to realize in the developing world, these two aspects must be observed in all levels of the government. Partnership is a significant factor that should be considered when adopting e-government. Apart from the international community, there are very few domestic organizations that can partner with government to build a strapping e-government structure (Ndou, 2004).

2.3.6 Strategy

In most developing countries, there is lack of long term e-government plans that are designed to achieve long term goals. These long term visions and plans have always been lacking in the developing world. Ndou (2004, p.15) confesses that *"one of the main challenges for e-governments is the establishment of an appropriate and context tailored strategy"*. Yet the advantage is that, having a common wider vision, dynamic strategy and a long-term focus for e-government helps engage and coordinate agencies and government ministries, tie e-government initiatives with broader strategic goals and maintain consistency during the course of the initiative (Lau, 2003 and Ndou, 2004).

2.3.7 Leadership role

In the developing countries, there are a few enterprising leader who are ready to take their excellent dynamic leadership skill to e-government with the view that e-government will be a political threat to them. Once an e-voting system is successfully adopted, chances of vote ridging will be minimal, and this will be a great threat to those leaders who want to cling to power through vote ridging. Ebrahim *et al.*, (2003), Sanchez *et al.*, (2003) as quoted in (Ebrahim and Irani, 2005, p.605) claims that *"some government officials perceive e-government as a potential threat to their power and viability because it might reduce their*

authority in government. Therefore, becoming reluctant to the idea of online transactions”. Political leadership is necessary before, during and after the project, it has an important role to play in making sure that the e-government vision is achieved by motivating, influencing and supporting the initiative (Lau, 2003 and Ndou, 2004).

2.3.8 Funding

In the developing world, the public sectors are mainly funded by the central government. The fund that flows to the public sector is either corrupted or does not flow habitually, The meager fund in some cases is divided to fight civil wars, famine and epidemics. This makes it virtually impossible to realize a steady - fast growth and development of the IT sector in most developing economies and this has been seen by scholars as a major setback for the development of e-government in Africa and the rest of the third world (Ebrahim and Irani, 2005).

The above challenges are not solely the only challenges that are encountered by e-governments projects in the developing world. The above challenges were mainly forwarded by Ndou (2004) although the research backed it up with the thoughts of Ebrahim and Irani (2005), Lau (2003) and Riley, (2004).

2.4 E-government frameworks

Building knowledge on e-government architectural framework by the government and the private sector is an importance strategic phase that leads to a dependable and successful e-government implementation (Ebrahim and Irani, 2005). Scholars have come up with different frameworks on how a successful e-government can be adopted.

2.5 Framework one: Kreizman and Fraga (2003)

Kreizman and Fraga (2003, p.1) came up with what they called "*Tactical Guidelines*" on how government can best implement an e-government, they advised that there should be lessons

learnt from the already successful e-government initiatives from other places, this would help avoid grave mistakes and losses that would be detrimental.

2.5.1 A holistic approach

"Approach e-government holistically" was the first point Kreizman and Fraga (2003, p.1) forwarded to e-government enthusiasts. It is harder if there is no holistic vision. They advised governments to initiate authority wide e-government and build up an e-government structural design. Essentially, having a holistic vision answers the question, *"which business are we really in?"*. A focused operating strategy explains how the service theory will be realized. It is also at this position that the government identifies those vital activities that it must do well to succeed. A triumphant e-government design consists of well-thought-out job design (Affisco and Soliman, 2006).

2.5.2 Develop specific e-government policies

Kreizman and Fraga (2003) claim that a winning e-government approach necessitates the existence of a foundational support structure, policies and procedure. Policies privacy, authentication, web content management, advertising, fees and payments were some of the ideas forwarded by the scholars. "digital policies" present the legal foundation for electronic information exchange, payment, and transactions. They are used to institute uniformity between paper and electronic documents, digital signatures, e-banking, verification, and electronic contracts. Therefore, the success of an e-government project and process is vastly reliant on governments role in ensuring a proper legal structure for their operation (Lau, 2003, Schwere and Deane, 2003).

2.5.3 Instituting a governance process

Robust leadership and strong collaboration governance structures are very significant for attaining a successful e-government initiative; employment of connoisseur to over see the project, e-governance should be accentuated. Assignment of power for approving projects or assigning proposal funding can rest in different positions or bodies, and this assignment

will be a result of historical issues, jurisdictional culture and management qualities present or absent. An effective public leadership and sustained commitment holds ground for an ultimate e-government success (Kreizman and Fraga, 2003 , Kumar and Best, 2006).

2.5.4 Sensitivity

Kreizman and Fraga (2003) recommended governments to prioritize and authorize initiatives based on operational efficiency, constituency service and political returns with fairness to all citizens. Showing some sensitivity through the assessment of various options, and evaluating whether the option taken by government is realistic and significant (Ndou, 2004).

2.5.5 Develop a unified marketing brand

Any business will not be recognized and will not make profit if it is not promoted. An e-government initiative like any other business needs to be promoted among the citizens. Creating awareness about the initiative will make the project popular. The government could use media house and sensitization seminars, bills, billboards, banners, business cards to promote the project (Kreizman and Fraga, 2003) .

2.5.6 Shared services

Government can go in to partnership with the private sector and make use of the infrastructure own by non governmental organizations. The telecommunication industry in the developing world is slowly but surely spreading its root down to the rural areas, government therefore can partner with the private telecommunication sector and share the necessary infrastructure (Kreizman and Fraga, 2003).

2.5.7 Address privacy and security

Addressing privacy and security was yet another important factor for a successful e-government project. There is a need to make sure the system is secure and can be trusted. Kreizman and

Fraga (2003) advises governments to address the common problem of privacy and security in the early stages of the initiative. Government has a major role in providing leadership in building a culture of privacy protection and security for its citizens and this can be done through developing a strong public policy as owner and operator of systems and networks, and also as a user of such systems and networks (Lau, 2003) .

In conclusion, the framework points out aspects that should be dealt with when adopting e-government. However, whereas the framework advocates for the use of technology, it says nothing on the appropriate technology. The framework is also silent on monitoring and evaluation. Nothing on e-readiness evaluation is mentioned in this framework.

2.6 Framework two: Ndou (2004)

Ndou (2004) in her framework revealed some important tips to consider for a successful design and implementation of an e-government initiative.

2.6.1 A holistic approach

Ndou (2004) just like Kreizman and Fraga (2003) recommends governments to approve of a holistic and complete approach, with an apparent vision and plan in order to prevail over the barriers and challenges of the transformation, This basically means that the active role of top leadership is much needed at the initial stages of the project so as to create public awareness, amend strong laws on ICT, build and sustain commitment and involvement of the private sector , the public and government, and forward a fair chunk of resources for the initiative.

2.6.2 Instituting governance process

The success of any business let alone e-government principally relies on human skill and potential. Training of staff should be the number one priority and incentives should be given to those that already possess the necessary skills and knowledge. The users of the initiative or system on the other hand should be trained on basic knowledge on how the system works

(Ndou, 2004). Training should also spread out to the society including: homes, businesses, schools, etc in order to build Human ICT capacity and to decrease on ICT illiteracy levels (Zaied *at al.*, 2007).

2.6.3 Sensitivity

Ndou (2004, p.17) advises governments to *"show sensitivity to local realities by assessing and evaluating different alternatives, ways and solutions for digital government development including mobile telephones, kiosks, and multi-channel access to services. Find viable solutions to ensure the effective participation of the community in the information economy"*. When searching for information about government services, is it necessary for citizens to go to government web sites? or do they prefer to do that by telephone or by an in-person visit? all of these dimensions mentioned above should be weighed by government before a decision is taken (Kumar *et al.*, 2007).

2.6.4 Develop a unified marketing brand

For any e-government project to succeed the public should be aware of the initiative and this can be done through organize workshops, events, seminars, conferences with the sole purpose of creating awareness about the reimbursements that a digital office can create. This collective learning promotes the continuous capacity to adopt innovations brought by e-government (Carr and Leary 2007, Ndou, 2004).

2.6.5 Shared services

Collaboration and coordination among ministries, departments and the private sector increases efficiency and effectiveness in process handling, if the barriers and challenges of partnership between the government, national, international organizations and other institutions is addressed, e-government will be a success (Ndou, 2004). All government departments can play an important role in navigating e-government implementation across government, a framework for collaboration across agencies can keep e-government activities aligned (Lau, 2003).

2.6.6 E-readiness assessment

Zaied *et al.* (2007) quoted from (APEC, 2000) defined e-readiness as the extent to which an economy or community is ready to join in the digital economy, it is better to begin with e-readiness evaluation which will help the government and other partners to be aware of the existing ICT laws, infrastructure, skilled human resource, funding, partners, computer illiteracy rate and the general reaction of the public towards e-governments adoption. The outcome of the evaluation will be very instrumental in developing human resource, soliciting for fund, creating strong laws, building ICT infrastructure and educating the masses about the up coming venture (Ndou, 2004). Schware and Deane (2003) state that the e-readiness assessment is important because, limited skills of civil servants hinder e-applications, yet also, the absence of necessary e-infrastructure makes it difficult for government to interact with citizens and businesses electronically.

2.6.7 Prepare to manage knowledge and change

Put in place knowledge management procedures and apparatus to ensure easy usage (i.e storage, usage and retrieval) of strategic information and knowledge for improved and speedy decision-making process. Room should also be created for further adoption and growth of the initiative (Ndou, 2004). Spread out participation across hierarchical levels, open feed back systems, and also organize frequent meetings on the system (Carr and Leary, 2007)

2.6.8 Think small, be agile and fast

Ndou (2004) in her framework advises governments to start on with viable pilot projects, customized to the exact contexts. Starting small and spreading wide will help minimized grave mistakes and losses. Build up gradually putting in mind the challenges and hindrances that lie a head. This method enables the project to manage risks and harness the increasing pressure by systematically building on an accepted success before going the next step (Chevallier *et al.*, 2006).

In conclusion, although this framework seems holistic, it is not organized in to- what comes first and what follows, this framework lacks a systematic flow of events. Every initiative

requires a well drafted project requirement tool which is not shown in this framework. This framework also did not point out the necessity of critically studying other projects of the same nature that have succeeded elsewhere, neither did it address the problem of security and privacy.

2.7 Framework three: Uganda national information and communication technology policy framework-(NICTPF, 2003)

The impressive nature of Uganda's economic growth in the last decade has been attributed to liberalization, privatization, civil service reform, financial sector reforms and decentralization initiatives in the country. ICT just like other economic sectors has demonstrated to be the change agent of the 20th century and has the prospective to essentially transform the way authorities and businesses function (NICTPF, 2003). The government came up with a strategic framework for ICT adoption in Uganda.

Develop specific e-government policies

The present position of ICT in Uganda has been influenced by various policies, statutes, laws, acts and regulations, passed and enacted in the last 10 years. This will create a leveled field for the ICT sector to develop just like other sectors of the economy (NICTPF, 2003). According to the EACS (2005)-state laws should be restructured to recognize electronic services.

Shared services

Before 1996, Ugandas communication infrastructure was among the least developed both in the world, and in Africa as well. In addition, 70% of the communication services were mainly within in urban areas, leaving the rural areas with the least access to these vital communication services (NICTPF, 2003). There is need to spread out the necessary e-infrastructure to allow the citizens access e-government services (Schware and Deane, 2003). While significant funds will be required to expand the use of ICT all through the country, limited financial resources are not the major barrier to progress in this area. There are significant organizational factors that include; commitment to use ICT by decision makers, obtaining

the essential human resources, partnering, instituting appropriate regulatory environment, and developing the capacity to cope with rapid change (NICTPF, 2003).

Instituting governance process

The NICTPF (2003) framework stressed the need of building human resource, creating an e-knowledge society through ICT training in institutions of higher learning Makerere University, faculty of Computing and Information Technology, Islamic University in Uganda, Mbarara University of Science and Technology, Kyambogo University, Uganda Communications Institute, Uganda Management Institute. Training can as well extend to homes and businesses entities (Zaied *at al.*, 2007)

Application of ICT in Uganda

Although the level of infiltration of computers within the public service is convincingly high, the level of utilization of computers to support organizational activities and operations is still very low. There should be an integrated approach of ICT applications that cuts across all the sectors within the economy (NICTPF, 2003).

Monitoring, evaluation and review

The national ICT coordinating agency will make certain that the ICT policy is regularly reviewed and its implementation is continuously supervised and evaluated. Furthermore, a mechanism will be designed for assessing the impact of the National ICT Policy on the growth of the economy, reduction in poverty, ICT literacy, infrastructure growth, and any other relevant indicators (NICTPF, 2003).

In conclusion, NICTPF (2003) framework is general in nature, there was no evidence of a systematic approach, the framework did not tackle the issue of security and holistic approach in the e-process neither did the framework discuss issues of prior studies on successful and unsuccessful e-government systems elsewhere.

2.8 Framework four: East African regional e-government framework

The vision of regional integration in East Africa is to create wealth, raise the living standards of all people of East Africa and enhance international competitiveness of the region. The key to achieving this vision is increased production, trade and investments in the region with Information and Communication Technologies playing a leading role (EACS, 2005). This prompted the East African Community Secretariat (EACS) to come up with a regional e-government framework which deals with a few strategic areas namely:

1. Customs and Immigration Control
2. e-Parliament
3. e-Health
4. e-Banking, e-Procurement
5. e-Commerce and e-Tourism
6. Meteorological and Tidal Information

Develop specific e-government policies.

This can be done by adopting a protocol or directive on the promotion of e-government in the partner-states. This would facilitate a significant increase in investment on ICT infrastructure at the national level (EACS, 2005).

According to the EACS framework, the application of ICT to government may stumble upon legal or policy obstacles. Partner states must make sure that state laws are restructured to recognize electronic services. They must take practical steps to ensure that policies uphold rather than hamper e-governance (EACS, 2005).

Instituting governance process

Ndou (2004) called this "*Invest in human development*" -introduction of open and distance learning programs at schools and higher education. The policy should visibly assemble a

knowledge-sharing and collaboration agreement among leading institutions in the region with recognized expertise in areas of public administration, management, scientific and agricultural research aimed at building a capital of trained human resources for efficiently running e-government initiatives within the region (EACS, 2005).

Shared services

Easy access to Public Internet Access Points (PIAP) both in urban and village areas of the partner countries. In creating these PIAPs governments should use structural funds and work on public-private partnership basis (EACS, 2005). It is common that countries that have incorporated other partners/stake holders in their planning and implementation of concrete action e-government plans have seen e-government applications thrive immensely (Schware and Deane, 2003).

Poverty reduction and gender

The e-government strategy should be geared to enhance the productive capacity of the local community by encouraging labour-saving devices for women, forming rural multimedia centers for women, access to credit/loan opportunities information online re organising agricultural R&D to encourage labour intensive agriculture and development of small ruminants (EACS, 2005).

Coordination, monitoring and benchmarking

An enhanced collaboration, exchange of information and cooperation among partner states shall therefore boost the regional integration in terms of offering public services online. There is need to strategically evaluate and monitor the implementation of the policies and plans (EACS, 2005).

In conclusion, the East African e-government framework was designed to meet the needs of regional integration like customs and immigration control, e-parliament, e-health etc. However, the framework lacked a systematic approach, the framework lacked the foundation (what to do at this level), the design stage(planning and development), then finally the implementation stage(what it involves). Little was mention about funding and appropriate e-system.

2.9 Benefits of e-government

It is true that e-government if successfully adopted and managed well will support good governance, which may promote progress in developing countries. The democratic, business, and governmental aspects of governance are simplified and improved, cutting costs and providing better services to citizens and businesses. Transformation within the three (3) major authorities of government may be expected, namely: political, economic, and administrative (UNDP, 2004) .

2.9.1 Political (G2C)

There is always need for citizens to interact with government easily, and e-government makes it easier for the people to interact with government. Government through e-government will be able to interact with all citizens who can access the system at all levels, the citizens can easily get connected to government and easily get government services through an electronic means and this promotes e-democracy transparency and accountability within the government (UNDP, 2004 and Kamar & Ongondo, 2007).

2.9.2 Economic (G2B)

Services that e-government offers are not restricted to political, they stretch to business also, involving electronic transactions between government departments and the private sector. This normally occurs in an electronic marketplace. E-government is equally important to businesses as well. E-services such as e-procurement, e-banking, e-commerce or an online trader exchange, are among the services included in G2G and G2B services. This permits transparency in the bidding, banking and purchase process and gives prospect to other smaller businesses, this enables easy banking, procurement and purchase of commodities online (UNDP, 2004).

2.9.3 Administrative (G2G)

Government interdepartmental or inter-ministerial exchange of information and merges of related services is enhanced. Government process are always simplified to facilitate easy delivery of services and hence reducing bureaucracy, time wasting, space and costs (UNDP, 2004, Kamar and Ongondo, 2007).

2.9.4 Employees (G2E)

E-government provides an effective means of sharing information among employees. E-government through (G2E) boosts the employees knowledge as they share resources and learn from each other regardless of someone's background, job, tribe, religion etc (Kamar and Ongondo, 2007).

Conclusion

Despite the huge returns offered by e-government, there are still enormous challenges faced by e-government projects in the developing world. One would have the view that the numerous challenges faced by e-government implementers in the developing world would attract numerous remedies from e-government scholars. However, there are very few remedies for e-government failure in the developing world. A few remedies that have been forwarded by scholars are not explicit; there are some missing gaps in the remedies. Among the remedies/frameworks studied in the literature, little has been raised on the systems user friendliness, and fee charge for an e-government service. However, the frameworks forwarded by scholars has a vital contribution towards narrowing the e-government failure gap.

Chapter 3

METHODOLOGY

Myers (1997) asserts that research methods can be categorized in a number of ways, however the most well known distinction is between qualitative and quantitative research methods. Each of the research methods thrashed out below uses one or more techniques for collecting empirical data.

3.1 Attaining the Objectives

In order for the researcher to attain the stated objectives of this research, case study research methods were used as follows:

1. The first objective was achieved by selecting (using the case study selection methods) and critically analysing the design and implementation process (i.e earlier problems, planning, development, communication, integration and management processes) of five best e-government practices/projects and three unsuccessful e-government projects (i.e earlier problems, planning, development processes and reasons for their failure) from different developed and developing countries in the world, and also discusses the benefits of the 6 best projects to the citizens of each country. This helped in showing different perspectives on the aspects of e-government practices. The researcher then compared and contrasted the implementation and reported results on the performance of these projects in these countries.

Amaratunga (2001) supports and stresses that the aim of a detailed write up for each

case is to intimately become familiar with each case as an independent entity. This process therefore permits the unique patterns of each case to emerge before pushing towards generalised patterns across cases.

2. The second objective was attained by considering challenges faced during the implementation process of each of the-government projects. The researcher mainly derived the challenges from the failure factors of the three unsuccessful e-government projects that were understudy.
3. The third objective was achieved by identifying and formating the success factors for the each best project (using cross case analysis). Analysis on the similarities and differences on success factors of the six projects project was made. The research then considered the similar success factors in determining the critical success factors for an e-government project. The systematic approach was there after developed from a combination of critical success factors, studied frameworks and additional concepts from the researcher. The approach consists of two main stages, namely the design and implementation Stage. The graphical representation of the systematic approach was drawn in word document.
4. The fourth objective was attained by identifying issues to validate, selecting validation instruments, running instruments , gathering results, carrying out a validation analysis, and results presentation.

3.2 Case Study Research Method

Case study is a perfect methodology when a holistic, profound exploration is wanted says Winston (1997) quoting from (Feagin, Orum, and Sjoberg, 1991). Case study research does extremely well at bringing us to an understanding of a compound issue or object and can extend understanding or add strength to what is previously known through prior research, case studies stresses detailed contextual analysis of a limited number of events or circumstances and their relationships explains (Spring, 1997).

Yin (2004, p.1) affirms that "compared to other methods, the strength of the case study method is its ability to examine, in-depth, *a case* within its *real-life* context". Spring (1997) says that, case studies are somehow composite and need numerous sources of data and may

also include several cases inside a study. Case study method is used for building up theory to generate new concepts that normally challenges other theories, its also used to clarify circumstances, explore or illustrate an object or an occurrence. Its pertinent to real-life, present-day human conditions and its public accessibility through written reports. Case study results relate directly to the common reader's everyday experience and makes easy an understanding of complex real-life circumstances.

3.3 Case Studies Selection

The researcher reviewed a good number of successful and failure e-government projects which were implemented in the developed and developing countries but a few were selected depending on the mode and focus of the implementation and relevance to the research questions and topic under study. It must also be known that the six cases selected and analysed in this study as best practices and three analysed as failures have not been ranked against those not selected. Spring (1997) explains that outstanding case studies should be carefully selected examined. Spring (1997) further pointed out that cautious favoritism at the point of selection also helps put up borders around the cases. The case studies were selected based on the following;

3.3.1 International award/recognition

The researcher considered the international recognition of the system. During the survey, systems that won an international awards for excellent service provision were made the first priority. However, international a wards may not necessarily be enough to make a project successful but the ability to maintain and sustain success.

3.3.2 Case Study Content

Non-selection does not imply unsuitability or inferiority in any way. Non selection was affected by access to case material, mode and focus of the design, implementation and relevance to the research questions and the topic under study. The researcher looked at the complex design and implementation process, and the impact of the project on the government

and citizens. The analyses developed from the six success cases and three failure cases should thus be seen as instructive and illustrative examples of the best and worst cases in the developing world, but are far from being the only examples which could have been used.

However, disapproval that arises from case study method is that, it is microscopic because it lacks a good number of cases to study, if only one case is taken for study, it makes it unable in providing a universal conclusion (Winston, 1997). Fortunately, Perry (1998) cites that other scholars, based on experience have suggested a range within which the number of cases for any research should fall. For example, (Eisenhardt, 1989, p. 545) suggests "*between four and ten cases*". A number between four and ten cases works well, below four may bear little proof of the outcome and might not attract much attention (Perry, 1998). Nevertheless, Hamel *et al.*, (1993) forcefully defended case study and argued that the size of the sample does not really matter and does not make it a microscopic study. The objective of the study should create the parameters, and then should be applied to all research. In this way, even a single case could be considered satisfactory, so long as it meets the established purpose. However, this study took up nine cases for study. The aspects that were considered during the selection of these best practices were base on Kreizman and Fraga (2003) because the evaluation criteria involves all aspects of a successful e-government project.

3.3.3 Evaluation criteria based on Kreizman and Fraga (2003)

The criteria that has been explained below enables the researcher in choosing a successful project based on the mentioned parameters, in order for an e-government project to succeed, it should have fulfilled the following requirements as explained below:

1. Innovation and use of Web-based online technology to deliver government services. The researcher looked at the novelty, improvements and the state of the art of the system. The new significant developments in the system compared to the old system.
2. Efficiency or time saved, and ability to perform transactions. The researcher looked at the efficiency, competence, capability and proficiency of the a given system, the processing speed of the system compared to the old system. The cost and time saved by the system.

3. Economic benefits or money saved. The reimbursement, pay back and profits of the system, how the system has benefited the economy and more especially the citizens. How the system has cut down cost of operation both on the government's side and on the citizens.
4. Functionality, ease of use and improved access. The researcher also looked at the Handiness, practical and usefulness of the system, user friendliness of the system given the high illiteracy levels in the developing world and also how easy is it to be accessed by the citizens.
5. Participation of multiple government sectors. Sharing of the system among government and private sector, the involvement of government departments and the private sector and their contribution to building a successful e-government system.
6. Seamless service delivery. Interoperability was also considered, how the various devices worked and how it faultlessly and smoothly worked with the already existing system.
7. Customer centricity, privacy and security. How the system was tailor made for the citizens and how classified and protected the information used in the system is for citizens to trust it.
8. Leveraged partnership. The researcher also looked at the role of the private and public sector towards developing the system, the magnitude of corporation among the various partners was highly considered during this research.
9. And ease of replication. How easy it is to reproduce or duplicate the exact replica of the system elsewhere within the country.

The successful systems may not have fulfilled all the above mentioned parameters (i.e Kreizman and Fraga (2003) (parameters) but at least a considerable number of parameters should have been fulfilled especially the most critical ones such as a, b, c, d, g and i.

3.4 Data collection techniques

The researcher collected and stored multiple sources of evidence comprehensively and systematically. *"Case study research is not limited to a single source of data, as in the use of*

questionnaires to carry out a survey study. In fact, good case studies benefit from having multiple sources of evidence” (Yin, 2004, p.9) confesses.

Among the six primary sources of data outlined by Yin (1994) were: documentation, archival records, interviews, direct observation, participant observation, physical artifacts. However, Winston (1997), still quoting from (Yin, 1994) points out that it is significant to bear in mind that not all the six primary sources are applicable for all case studies- though the researcher should be proficient in dealing with all of them should the need arise, but each case will present different opportunities for data collection. Indeed, the case study’s unique strength is *”its ability to deal with a full variety of evidenced documents, artifacts, interviews, and observations”* (Kohlbacher, 2006) sites from (Yin, 2003, P.8) In this case, the researcher decided to take on the following methods:

3.4.1 Interview guide/questionnaires

Winston (1997) argues that interview is one of the most vital source of data when using case study method. The researcher decided to use the open ended interview, the researcher asked for the respondent’s opinion on events or facts. This helped to corroborate previously gathered data from documents and archives. Some of the advantages in using interview include; It is targeted and focuses on the study topic, and interview is insightful (Winston, 1997). Questionnaires were designed for the beneficiaries of the projects

3.4.2 Physical artifacts

This is any physical confirmation that can be found during a site visit. That might include tools, art works, notebooks, computer output, and other such physical evidence (Winston, 1997).

3.4.3 Documentation and Archival records

The researcher due to lack of resource was un able to conduct interviews and observation on projects in India, South Africa, Denmark, Finland and Mozambique decided to employ

two techniques of data collection, this included documentation and archival records-(Online survey). Different government web sites were then used as a source of information. Each online memoranda, agendas, administrative documents, newspaper articles, service records, organizational records, lists of names, survey data, and other such records were carefully reviewed and selected not only from government web sites but also other independent sources to prove its genuinity and accuracy. Winston (1997) confirms and quotes from Yin (1994) that the legality of the documents must be cautiously examined so as to evade incorrect data being included in the data base. One of the most significant uses of documents is to confirm evidence gathered from other sources. Yin (1994) pointed out the other strengths of using documentation as a data source and these included the following:

- Stable - Steady and un wavering data, there is a chance of repeated review
- Unobtrusive - exist prior to case study and data gathering does not require intrusion into the lives of respondents
- Exact -precision and accuracy, not deviating from truth or reality especially when it comes to names places etc.
- Broad coverage - extended time span
- Precise and quantitative

Kohlbacher (2006) sites from Yin (2003) puts it forward that, in order to maximise benefits from any of the six primary sources, three major principles must be followed:

- Use of multiple sources of evidence
- creation of a case study database
- maintaining a chain of evidence.

Sample selection

five departmental heads and five specialists involved in the design and implementation process were selected and interviews in each project. Questionnaires were distributed to forty beneficiaries of each e-government project in Uganda.

3.5 Designing case studies

The approach taken by the researcher to design and develop the case studies was guided by three central questions as pointed out in chapter 1 i.e how is the structure of a successful e-government project?, what factors are responsible for the success and failure of an e-government project?, given the high cost generally required by e-government, is it worthy for the governments in the developing world to launch more e-government projects? if yes, what are the benefits?. The investigator institutes the focus of the study by coming up with questions about the situation or problem to be studied and determining a purpose for the study (Spring, 1997). *Data is organized into an approach to highlight the focus of the study* (McNamara, 2008, p.13).

3.6 Data analysis

Data analysis in case study is one of the least developed aspects of the case study methodology. The investigator needs to rely on experience and the literature to present the evidence in various ways, using various explanations (Winston, 1997).

3.6.1 Using content analysis

Babbie (2001) cited in Kohlbacher (2006), defines content analysis as the study of documented human statements. It is *"essentially a coding operation,"* with coding being *"the process of transforming raw data into a standardized form"* (Babbie, 2001, p.309). An overall approach, that involves an analytical strategy which systematically examines forms of word patterns objectively (Tracy, 2001). In fact, Ryan and Bernard (2000) contend that coding compels the investigator to make verdicts about the connotations of contiguous block and that coding is *"the heart and soul"* of (whole) text analysis (Kohlbacher, 2006). In employing content analysis as a technique, the purpose is to get at portions of meaning by examining the data qualitatively. In fact the method entails a detailed study on how authors or respondents view and understand certain issues. It is important to always allow data to generate a theme naturally (Trace, 2001).

3.6.2 Using cross-case

The data was collected, and using content analysis-was coded in a cross-case table (search for patterns). The data was then formatted to follow a pattern. It is important that the person analyzing the data allows themes to emerge naturally (Trace, 2001). Yin (2004, p.9) also explains that *"In collecting case study data, the main idea is to "triangulate" or establish converging lines of evidence to make your findings as robust as possible"*. Yin (2004) still explaining on triangulation continues that the most preferred result occurs when a number of independent sources all point to a matching set of events or facts.

Spring (1997) advocates for this technique and reasons that the cross-case search for patterns, deters investigators from reaching premature end in that the researchers should look at the data in many diverse ways. Cross-case analysis split the data by type in all cases examined. When the sample from one data type is confirmed by the evidence from another, then the finding of the case study is stronger. Online documents were all subjected to content analysis, categorizing the similarities and differences among the case studies. The similarities especially among the successful cases were considered as the critical success factors for success.

Yin (1994) emphasised on high quality analysis of data. In order to accomplish this, he presented four principles that should be given much attention during data analysis:

1. Show that the analysis relied on all the relevant evidence
2. Include all major rival interpretations in the analysis
3. Address the most significant aspect of the case study
4. Use the researcher's prior, expert knowledge to further the analysis

3.7 Data presentation

After data was collected, it was sorted out, analyzed and presented according to each objective. Before data was presented, it was inspected and edited without distorting the original

message. Data was presented in form of chapters, introduction in chapter 1, literature review in chapter 2 and the methodology was put in chapter 3. Chapter 4 is presentation of findings, chapter 5 includes data analysis, the proposed approach, the recommendations and conclusion. Statistical analysis in chapter 4 was done using cross-case and frequency tabulation tables, pie charts, graphs were used to summarise statistically analysed data.

3.8 Validation of the approach

This covers the means by which a decision is made as to whether a tool is fit for purpose it was designed for or it falls short of the desired performance. One way of validating a quality framework is against the knowledge of experts in the field. Experts have a wide, implicit and sometimes explicit understanding acquired over a long period of time (Inglis, 2008 and Polanyi, 1966). The researcher used the experts' wide knowledge to validate the proposed approach validation exercise of this research was based on:

1. **Issues measured.** The issues involved include all the components of the approach, determining the logical process or steps and the viability of each of the components in the approach.
2. **Instrument.** Instruments form the technique used to capture information from the evaluation exercise. The technique that were used by the researcher to validate the approach included questionnaires.
3. **Analysis.** Information obtained in the validation process was subjected to analysis in order to draw a true meaning and implications from data collected. Context analysis and frequency tables was used as explained in 3.6.1 above. The results of the analysis was the discussed in the write-up.

3.8.1 Panel of experts

The research sought the wide knowledge of experts in Face Technologies, a reputable IT firm. Inglis (2008) accepts that the use of an experts offers an opportunity of a wide rich knowledge on the subject matter and reduces the bias that arises when one relies on one

expert alone, though the use of an expert panel does not of itself provide any assurance that the decision made will be the best informed. Credible results will be determined by the composition of the panel, panel briefing on the subject matter and what it intends to solve, whether the panel was given the a chance to review its decisions. The larger the panel, the more reliable and credible will be the decisions that are made. The researcher, therefore sought the counsel of ten (10) experts with knowledge in IT and ICT disciplines. The outcome of the validation was re-submitted to the experts for review.

In conclusion, the above method and techniques of carrying out research was the most appropriate given the unfevourable circumstances that prompted the researcher to leave out other research methods and data collection techniques.

Chapter 4

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents an account of research finding. Guided by the research questions, interviews were conducted, physical artifacts were seen, documents and archival records were critically reviewed by the researcher and this was followed by a writeup. This chapter also provides an account on the design and implementation process of a number of different e-government projects in developed and developing countries, an analysis on why and how they were implemented and their impact on the citizens. A total of four best practices were chosen from the developing countries, from Uganda the study was on Electronics Technicians Association-ICT chapter and ICT4D research and resource centre for rural development in Toro region, western Uganda.

In order to understand the different aspects of e-government in different countries, the researcher investigated projects in India and Europe. In India the projects included Bhoomi Land Title Computerisation and Front-End First: Citizen payment at FRIENDS centers in Kerala. These projects were chosen based on Kreizman and Fraga (2003) criteria and their commendable performance in Uganda and India and had attracted International recognition.

The research investigated two best practices in Europe which included the electronic crime report-FINLAND and BiblioTek DK-DENMARK which had land mark positive effects in the respective countries. Failure cases like the failed e-voting system in Uganda, Gyandoot

project in India land licensing and planning system for Beira city Mozambique were chosen because of the immense failure that resulted in to a huge loss to the respective governments. All the nine cases were evaluated based on Kreizman and Fraga (2003) criteria that is explained in chapter 3

Chapter 4 therefore analyses e-government design process with specific reference to concepts such as- earlier problems, planning, development, communication, integration and management of the six best project. This chapter also looks at the benefits of e-government projects and this enables this study to answer the research question (i.e given the high cost generally required by e-government, is it worthy for the governments in the developing world to launch more e-government projects? what are the benefits? and also factors are responsible for the success and failure of an e-government project). This chapter helps to achieve the first objective by reviewing the design and implementation process of selected e-government projects and benefits of the projects to the masses. It helps show different aspects of e-government in different countries. The research however, limits the failure cases to earlier problem, planning, development and reasons for their failure. Reasons for their failure and the changes that will be discussed in this chapter will enables this study to answer the second research question (why has e-government failed in the developing world).

4.2 Best e-government projects/practices in the developing World

4.2.1 Electronics Technicians Association-ICT chapter-Uganda

Introduction

Electronics Technicians Association of Uganda (ETA) is a national professional association founded by technicians and servicing dealers in 2006. This project was considered by the researcher because ETA was nominated as a finalist for the Stockholm challenge event award for e-government. The researcher also evaluated ETA based on Kreizman and Fraga (2003). The researcher used interview guide, questionnaires, documents, archives, physical artifacts for collecting relevant data. ETA is the leader in promoting broad technician training courses and provides maximum means for technicians to gain the knowledge and skills necessary to perform installation and maintenance of the high technology products of today's world. The ETA has numerous departments- some of which include: Electronics educators department, communications department, software & programming departments, shop owners department; cabling, computing & networking department, industrial technicians departments.

1. The problem

Most technicians within the association had outdated knowledge and could only work on old technology. Most of them had no or very little knowledge on the state of the art technology. The association initiated a program that was designed to carry out a study on the number of technicians who were rendered incompetent because of the dynamic nature of technology today. The program come up with the report that a big number of technicians were ignorant on the state of the art technologies. ICT was therefore the only answer to the problem, it is utilized to deliver distant cost effective and timely solutions for the members, ranging from training based on the state of the art technologies, communication, conferencing, reporting, shopping, etc.

2. The Planning process

The administrative nature of ETA constitutes of the national chairperson, vice chairperson, secretary treasurer and the departmental heads. The national chairperson

and the board are assisted by the national consultative committee. Co-ordination of its activities is done from a fully equipped self sustaining national workshop premise which is accessible at a small fee by local member technicians. The fee is for covering maintenance and covering operational costs. The project ICT workshop is a source of industrial training for member within the association. The project makes use of a digital camera, to capture and document videos on the on- going complex works such as fiber optics installations, satellite receiver installations, etc. then utilize them as a learning resource by technicians.

3. The development process

- **Software development**

Yahoo messenger was set up, the projects web site contains an online jobs program and an online database, a compact disk holding information, a technical help line is available. Online technician certification courses offered include; computer and software, wireless communication, cellular, audio/video distribution, data cabling, networking, satellite installation, e-commerce, fiber optic, radar, industrial, telecommunications, consumer electronics, biomedical, avionics are supplemented by DVDs/CDs and videos. Local member electronics shops, university computer labs, computer labs for government ministries and NGOs with permanent Internet access make use of yahoo messengers to deliver instant requests amongst themselves and to technician workshops and vice versa.

- **Partnership**

ETA Uganda collaborates with Electronics Technicians Association International, Ministry of Information and Communication Technology and other organizations in Uganda to help members to achieve discounted certification opportunities, access to international and regional conferences, help in individual support, technical publications and empowerment (financial and technical), access to local and international jobs programs, student chapters, international technician discussion forums etc.

- **Communication**

The communication of the project was made during the general annual meeting of the members, e-mails and sms were also sent to the members who already had e-mails and mobile phones. Communication about the project was further made

during different workshops for different divisions.

- **Management process**

While the association is chaired by a national chairperson, a technician by profession who works hand in hand with electronics department chairpersons; departments such as shop owner's department, satellite dealer's association and electronics educator's department help the association to work closely with ICT firms. On the other hand, the top administrative official is the president, with is occupied by a top government official in charge of Information and Communications Technology. The patron post is constitutionally occupied by a top official from a renowned donor agency in the ICT sector,

Benefits of the project to the technicians

1. Many members within the association have learnt how to use the Internet proficiently, like chatting using the yahoo messenger, e-mailing, downloading etc. Many members confessed having gotten new jobs through an online job mailing member list. The same online job program offers monthly online tips on how to write a resume, what to expect from an interview, etc
2. Three quarters of members have successfully finished at least one online technician certification course in the field of computer and software, wireless communication, cellular, audio/video distribution, data cabling, networking, satellite installation, e-commerce, fiber optic and telecommunications,
3. Purchasing of devices and spare parts has been made easier to the members. Local technicians can now get instant access to affordable products and spares, as one message sent on group mail can instantly be responded to by more than 20 shops, thus providing more options and protecting electronics consumers.
4. It is now easier to mobilise the technician nationwide to take part in the program through the project web site, mailing list , sms and yahoo messenger.
5. Many working student technicians, electronics shops and communications firms both urban and rural that realized the need to open up e-mail accounts and subscribe to its technical forum receive timely technical solutions.

6. Using ICT, It has networked with several international resourceful associations creating a network rich with human resource which has in return enabled it to get donations for workshop equipment. Redundant learning and conference equipment for use in the workshop is donated off from communication sites, stores, shops and industries.
7. Many technicians got jobs through the project's online jobs program and technical forum, resumes of technicians are filed while a jobs program is run to find matching industrial training and employment opportunities for technicians.
8. Fake consumer products and unreliable and quark technicians on the market are black-listed. Technicians' interests and views are presented to government and international manufacturers.
9. It has successfully conducted job interviews for local firms desiring to hire competent technicians, the project also addressed problems of complex service literature from manufacturers and complex technical problems.

4.2.2 Critical success factors

The problem

The solution to the ever changing technology had rendered most of the technicians ignorant was a biting factor. This prompted the association to come up with the solution, and the solution was the use of ICT to educate and facilitate technicians in order to cope up with the state of the art technology.

Software development

The use of basic programs like group mail, yahoo messenger, sms and the projects' web site made it easier for the user/technician to access their mails, and chat with other technicians world wide. The project's web site is secure and access to material was by subscription in which a technician is given a secure password.

Funding

The project was mainly supported by the little fund raised from the members when they are joining the association, then the subscription when a member has opted to take up one of the online certification provided by the association and also fund raise from donation from the ministry and other local and international organizations.

Government backing and partnership

The project won the approval of the Ministry of Information and Communication Technology. One of the millennium development goals of the government is to create the state of the art e-society in Uganda. The project therefore received considerable support from the Ministry. The association keeps in touch with key policy makers, government's development partners, educational institutions and private sector.

Leadership and management

The president, the project patron, the national chairperson, the electronics department chairpersons worked hand in hand to see to it that the project succeeds

Communication

The project succeeded as a result of the timely communication that was made by the association to its members. This attracted rapid response from the technicians. Communication was done through sms, e-mails, workshops etc

Infrastructure and innovation

Cheap online video conferences are utilized to organize meetings and international conferences with international partners. A compact disk which holds information of about 100,000 technical problems faced by technicians involved in the repair of televisions, radios, monitors, has been compiled and is being utilized by consumer electronics technicians who don't have Internet access.

4.2.3 ICT4D -research and resource centre for rural development in Toro region, Western Uganda

Introduction

This project was considered by the researcher because this project was nominated as a finalist for the Stockholm Challenge Event award for economic development. The researcher also evaluated the project based on Kreizman and Fraga (2003). The researcher used interview guide, documents, archives, physical artifacts for collecting relevant data. ICT4D which literary means Information Communication Technology for development was started in 2005 with a sole aim of creating a centre of excellence where community development workers, youths, men and women are empowered with ICT4D knowledge and skills for socio-economic development of Toro region by the end of 2011. The project is implemented by Toro Development Network, which happens to be a local community based NGO in Toro Region

1. Earlier problems

A majority of the youths, men, workers and women who were educated and un-educated in Toro Kingdom/region were becoming redundant, dis-orderly and idol. There was a growing number of un-employed youth, ICT illiterate workers and idol men and women in the kingdom. There was a need to harness this redundant man power for the development of the region through equipping them with ICT4D knowledge and skills. There was also need to improve small-scale agricultural production in the region using customized, affordable and relevant Information and Communication Technologies for Development

2. The planning process

There was need to carryout research, solicit for and build a state of the art ICT infrastructure, with usable equipment that include appropriate hardware and software. Training was provided to community development workers, local youths, men and women, share knowledge and skills with community based organizations and NGOs. Regular monitoring and evaluation the impact of the resource centre activities on realizing the long term goals and objectives of Toro Development network.

Main Objectives:

- (a) Perform an investigation on the availability ICT infrastructure, technology, application appropriateness based on cultural norms of local population and government policies by September 2009.
- (b) Offer research skills and equipment for access, training and use of modern ICT services to 200 community development workers and 400 youth leaders in Toro region by the year 2011.
- (c) Set up a wireless local area network for information and knowledge sharing amongst the 10 main CBOs and NGOs involved in youth and gender development activities in Fort portal town by the year 2011.
- (d) Organize orientation workshops; conferences and radio talk shows targeted to the youth leaders and community development workers on how to train, access and use the ICT resource centre services by the year 2011.
- (e) Train 400 youth leaders and 200 community development workers and enable them access modern ICT facilities at the resource centre to enhance the acquired techniques which they will finally apply to their community development activities by the year 2011.
- (f) Get involved in research on effective integration of modern ICTs in businesses and other small-scale income generating projects of youth and women groups in at least two (2) CBOs per sub county in Toro region by the year 2011.

3. The development process

- **Software development**

The software that was used was Open Source, the desktop and, Laptop computers used in the projects had MS word, Excel, Access, etc, Land lines and Cell phones are also used to facilitate communication. Information can be access in government offices, private business places, public Library, Tele center and Cafe.

- **Partnership**

The project has been able to create and maintain partnerships with funding organizations like Kabissa in USA, I-Network Uganda, Computer Aid International (CAI), African Institute for Capacity Development (AICAD) and International Development Research Centre (IDRC).

- **Communication and dissemination process**

The three privately owned radios stations in the community; Voice of Toro and Life FM in Kabarole district and Kyenjojo Development Radio in Kyenjojo district (through Private Sector Partnership strategy), were involved creating and organizing ICT4D community awareness programmes through announcements, talk shows and to disseminate our research findings where an average 20,000 (youths, men and women) beneficiaries are directly empowered.

- **Integration process**

The project began as a pilot scheme in one of the two districts in the region. It began in fort portal town in kabarole district before it rolled out to the other district of Kyenjojo district.

- **Management process**

Toro Development Network is endowed with well trained and experience labour force that has been successful in implementing the project. It has also partnered with SATNET (Sustainable Agricultural Trainers Network) IMARK (Information Management Resource Kit) among others train community workers on basic web technologies and usage.

Benefits of the project

Farmers have gotten better prices for their produce as they get price information in the wider market and sellers get information on the volumes the farmers are producing through information based agricultural production practices using the Internet(e-mails and e-articles to farmers) and market research (the use of mobile and public pay phones and Internet to determine prices in urban centres and global markets.

All the people who were trained have opened e-mail accounts. Group mails have been opened especially for the farmers group for easy dissemination of any vital agricultural information got from any of the members or from Toro Development Network mainly on market prices, new technology, whats happening elsewhere etc

High yields for farmers has doubled as a result of new farming methods that were copied from partners in South Africa and Kenya

Toro Development Network builds has built human capacity of rural people to access and use modern and traditional ICTs for development on their own. 20,000 (youths, men and women) have been empowered in related ICT knowledge in one way or the other through community awareness programmes over radio .

A good percentage of the beneficiaries of the training have either gotten employment or have opened up their own business (ICT related)

Internet has been used to expand ICT4D research boundaries and improve Toro Development's Civil Society Partnership strategy through online networks established with other rural ICT projects in Ghana, Senegal, South Africa and Kenya.

Toro Development Network has been able to develop and sustain partnerships with funding organizations like Kabissa in USA, InfoDev, Computer Aid International (CAI), International Development Research Centre (IDRC), African Institute for Capacity Development (AICAD) and Bridges.org through online networks.

In collaboration with its partners, Toro Development Network has been able to train staff and community development workers in quality information gathering, community knowledge sharing and management at affordable costs through the use of Web 2.0 Tools. The project staff members have also been trained in order to train community workers in the region.

Critical success factors

- **The Problem**

The problem in Toro was identified- there was need to harness un exploited abundant labour that could play a very vital role in the development of the region. There was also need to create an ICT literate society that would use the ICT skills for information gathering, community knowledge sharing and management and to better their life.

- **Software development**

The software that is used in the project is open source which is cheaply available like the web 2.0 tools

- **Funding**

Development partners like Kabissa in USA, InfoDev, Computer Aid International (CAI), International Development Research Centre (IDRC) and African Institute for Capacity Development (AICAD) helped finance the project.

- **Government backing and partnership**

The Ministry of ICT okayed the project and there was also some support from the local governments of Kabarole and Kyenjojo districts. The Minister of ICT visited the project in 2007 and promised to spread it through out the country.

- **Pilot scheme**

The pilot scheme of the project was well evidence when the projects was first started in fort portal town in the district of Kabarole, then it rolled out to the other district of Kyenjojo.

- **Leadership and management**

The leadership of Toro Development Network is steered by well trained and experience professional who worked hand in hand to see that project succeed. The executive director of Toro Development Network possess various computer certifications.

- **Innovation and infrastructure**

Toro Development Network embarked on lobbying and developing the necessary infrastructure for the project. Like building the Tele center in Kabarole, procuring the necessary hard and software etc. The already available infrastructure was also used like land lines.

- **Communication**

The three privately owned radios stations in the community; voice of Toro and life FM in Kabarole district and Kyenjojo development radio in Kyenjojo district (through private sector partnership strategy) played a great role in communicating the messages a cross

4.2.4 Bhoomi land title computerisation- in India

Introduction

The Bhoomi land computerisation was considered based on Kreizman and Fraga (2003). More so, the researcher considered the incredible international recognition and honours heaped by Bhoomi, and this included:

1. The UN public service award for good governance
2. Silver award in Commonwealth Association of Public Administration and Management (CAPAM) innovation awards (2002)
3. Finalist in Stockholm challenge award (2002)
4. Laureate in tech museum awards (2002)

Bhoomi as documented by Bhoomi 2006 was prestigious Bhoomi e-government project undertaken by Karnataka State Government under the centrally sponsored scheme of computerisation of land records. This scheme is sponsored by Ministry of Rural Development, government of India. All 20 million land records of 6.7 million land owners in one hundred and seventy six taluks of Karnataka have been computerised. This system works with the software called "BHOOMI" designed fully in-house by National Informatics Center(NIC), Bangalore. While the project is largely funded by government of India, some critical components of this project are funded by state government. This project also decided to fully support development of a citizen centric land records system even if it meant substantial investment by state government for those components of the project which were not being funded by federal government. This political mandate was backed by full administration efforts at all levels.

1. Earlier problems

The manual system of land records maintenance was highly opaque, prone to manipulations, harassment and extortion was the order of the day, delay in delivery of land records, it was a cumbersome mutation process , it lacked timely data for planning purpose, had cumbersome crop loan mechanism and there often a delay in disposal of

civil litigation. In fact, in Bangalore division alone, 25 billion worth of government land had been manipulated and shown in the name of private influential persons. Opaque manual system facilitated manipulation by unscrupulous officials.

2. **The planning process**

- (a) "Bhoomi" is a very comprehensive software designed by NIC, Bangalore. This software provides for printing of land records as and when required. It incorporates process of online updating to ensure that the Real Time Computer system (RTCs) provided to the farmers is in sync with the time. The manual land records in operationalized taluks have been declared illegal. All the mutations to the land records database are done on the computer itself so as to ensure that data on computer remain current with time.
- (b) It incorporates the state of the art bio-login metrics system from Compaq, which authenticates various users on the Bhoomi software on the basis of fingerprints. This ensures that no body can hack the system by imitating other users. The replacement of password security system by fingerprint authentication system would go a long way to ensure that database are free from any hacking and that the non-repudiation system is in place. This software also has the provision of scanning of original mutation orders of the revenue inspector (who is the authorised person to pass orders in the mutations in the field) and notices served on interested parties. Both documents are scanned to ensure that not only responsibility can be fixed on officials by showing the original documents signed by them but also to ensure that the interested parties do not claim in the court that they were not served with the notice before effecting the mutation.
- (c) The software enables the administrators to generate various reports based on type of soil, land holding size, type of crops grown etc. This information would enable administrators to take informed policy decision.
- (d) The farmers can collect their land records from kiosk established in every sub district (Taluk). The entire software including user interface is in the vernacular language (Kannada). There is absolutely no paper work required at kiosk for getting the land records. Authenticity and integrity assured through biometrics system. Provision of second monitor where the citizen can see the transaction as it is being entered like property number, owner's name, khata number. The

farmers can also lodge request for change in land title (Mutation) with assured result within statutory period without need of approaching of any official.

3. **The Development Process**

- **Software development**

Selected field level personnel were invited to participate in the software development process for various Bhoomi modules through a formal state level Bhoomi committee. Meetings were held with participation from various levels in the department to elicit suggestions for improvement, and decisions taken at these meetings were incorporated into the software design. Nearly one hundred forty five man-months were spent on software development. A further effort of thirty man-months will be needed to upgrade to the next version

- **Partnership**

A decision was made to out source the data entry work to private data entry agencies. This step was also preferred as it would have facilitated huge data entry capabilities at district level which could not only be later useful for other similar project but also would have provide employment to educated but unemployed youth. To ensure correctness of digitized land records data obtained after data entry, detailed guidelines were issued and scrupulous compliance to these guidelines was ensured. As per these guidelines all the officials officers right from the lowest level of village officials to highest level of Deputy Commissioner (Incharge officer for all activities in a district) checked and verified the correctness of the computerised land records.

4. **The communication/dissemination Process**

Karnataka State is divided into four divisions and every division had its own variation in maintenance of land records. Four divisional one day workshops attended by representatives from the hierarchy of Revenue Department and representatives of data entry agencies threw much needed insight into such variations. The feedback from such workshops was documented data entry software modified to take care of additional needs because of variations in maintenance of land records.

The government decided to hold state level workshops to educate all fifty three Assistant Commissioners (one Assistant Commissioner is typically incharge supervisory

officer for three-four sub districts), all one hundred and seventy seven tahsildars (officers direct incharge of one hundred and seventy seven sub district known as taluks) and all one hundred and seventy seven Deputy tahsildars. In all, four such state level full day workshops were held. Each of them were attended by about one hundred officers. These officers then trained the nine thousand village officials and nine thousand Revenue Inspectors (officials one rank above the rank of village officials). There was also Training of eight thousand revenue staff up to Village Accountant level on data entry operation.

5. **The integration process**

While data entry was started in all districts simultaneously after workshops at division, state and district levels, the state level Bhoomi team concentrated on five pilot sub districts and expedited the data entry process by direct interventions. These five taluks were chosen very carefully to ensure success of Pilots. The proximity to Bangalore was one of the criterion. The implementation in these five sub districts gave very useful experience. The scheme expanded to twenty seven pilot sub districts. In third phase all remaining one hundred forty five sub districts were taken up simultaneously for implementation. Phasing of implementation helped in smooth replication of the scheme.

6. **Management process**

Change management

The technical support at the state level by way of comprehensive "Bhoomi" software development and data entry software was provided by National Informatic Officers (NIC). At the district level such support was planned to be provided by NIC's district officers known as District Informatic Officer (DIO). However it was noticed that inspite of DIOs wanting to extend such support at district level, they did not have the type of time required for this purpose. Hence the government provided one hundred forty five consultants - one each to every one hundred forty five districts to advise and help the district administration on implementation of this project.

The figure next page shows how Karnataka farmers access their land records from the Bhoomi kiosks located at every sub district.



Kiosk at the Sub District level



Figure 4.1: Bhoomi kiosk-User friendly citizen interface *adopted from www.revdept-01.kar.nic.in/*

Benefits of the Bhoomi Project

To the farmers

- (a) Farmers can quickly get their land records from kiosks and are protected from harassment and extortion. As against time delay of three to thirty days they now get their records in less than two minutes. No overhead cost is to be incurred. No application is required to be submitted at the kiosk. The records are authentic and legible. Use of biometrics authentication system for updating records has freed farmers from the worry of probable manipulation of their records by some times some unscrupulous officials.
- (b) They can lodge application for mutation (change in land title) to their land records at the mutation kiosks, get acknowledgment for the same and can monitor the progress using touch screen kiosks available in some Bhoomi centers.
- (c) Farmers can also get the official status report of their request for mutation which would let them know the stage at which their request is pending.
- (d) Access to farm credit would now be less cumbersome. Online connectivity to banks would ensure farm credit to farmers in less than five days as against

twenty five to thirty days in manual system.

- (e) It would be easier for the farmers to pursue land related litigation in the court.

To the administrators

Easy maintenance and updation of land records documents. Support for development programs based on valuable land records data like various crops grown in a village or a sub district can now be available almost immediately. Accurate and timely preparation of annual records like land revenue. The government has found it easy to monitor lands and prevent encroachment. In the past, monitoring had costed a reported loss of Rs.25 billion to state government by way of officials tampering with records. Courts can be able to make use of land record database for adjudicating various civil disputes related to ownership, possession and cultivation in various courts.

Financial institutions

Online connectivity to financial institutions help banks in planning for their farm credit related activities. Online connectivity would also helps banks to ensure that revenue administration is indicating bank's charge on land records of such farmers who have availed crop loans. Financial Institutions can easy create change on land of those farmers who take crop loans.

Private sector

Private sector had complained of absence of crop and land data for their planning purpose. Bhoomi data would help supplier of various agricultural inputs like seeds, pesticide, fertilizers etc. to plan their activities. Also details of irrigated lands and pattern of land holding could be used by private sector for more informed decision making. In manual system such data was just not available.

4.2.5 Critical success factors for Bhoomi project

- **The problem**

It is well evident that before the Bhoomi project began, there were pressing land problems that the state of Karnataka in India was facing as discussed under "earlier problems" at the beginning of this chapter.

- **Software development**

Software development was greatly taken note of both during the planning and the development stage, this is also well discussed in the planning and development stages of this project

- **Funding**

The project was also well funded, as discussed at the introduction of this chapter that the project is largely funded by government of India, some vital components of this project were funded by State government . It was basically a joint venture between the central government and the state government .

- **Government backing and partnership**

As it is discussed in the introduction that the political mandate was backed by full administration efforts at all levels. A verdict was reached to subcontract the data entry exercise to private data entry agencies

- **Pilot scheme**

This project was implemented in phases as discussed in the integration process, Bhoomi squad concentrated on five pilot sub districts and accelerate the data entry process by direct involvement. These five taluks were chosen very cautiously to ensure success of Pilots and this gave a very helpful understanding for yet the remaining districts

- **Leadership and management**

The government state level workshops for Assistant Commissioners, who were incharge of supervisory in three-four sub districts, Tahsildars incharge of each sub district as explained in the development process.

- **Innovation and infrastructure**

The government had to build the Bhoomi software, a quire personal computer with taught screens and build kiosks so as to provide the necessary services .

- **Security and privacy**

The Bhoomi system incorporated the state of the art bio-login metrics system from Compaq, which validate various users on the Bhoomi software on the basis of fingerprints. This makes certain that no body can hack the system by emulating other

users. The substitution of password security system by fingerprint authentication system makes database are free from any hacking and that the non-repudiation system is in place .

- **Communication**

Several workshops that attraction hundreds of thousands of participants were held, this also held to dessiminate information about the project .

4.2.6 Front-end first: citizen payment at FRIENDS centers in Kerala-India

Introduction

This system was also considered by the research because of its success and benefits to the community. Basing on Kreizman and Fraga's (2003) yardstick in the methodology, the system had the qualities of a successful e-government project, FRIENDS was awarded ISO 9001:2000 Certification for its citizen friendly services and quality standards. According to records from Kiran and Heeks (2003), and FRIENDS (2005), 97.4% of the users preferred the system, 65% of the total cost involved in the before the system was introduced was saved. forwarded facts about the system as written below.

The FRIENDS is a government portal that was designed lessen cueing in various government departments when paying different dues in the state of Kerala. According to FRIENDS (2005) the word FRIENDS means Fast, Reliable, Instant, Efficient, Network for Disbursement of Services. The centers offer a one-stop, front-end, IT-enabled payment counter facility to citizens to make all kinds of government payments in the state of Kerala in South India. The centers are a project of the Kerala State IT Mission, an executive agency of the State's Department of Information Technology. The aim of the project is to provide a single-window payment mechanism for government-to-citizen interaction in the state of Kerala, India.

1. Earlier problem

As in all Indian states, Kerala has a number of different government and public sector organizations collecting taxes, utility bills, and other fees and payments. Individual citizens have historically been expected to pay at the office of the department or the agency concerned. This means that every citizen has to personally visit at least seven offices and stand in queues waiting their turn to pay the taxes and other payments due to government. Some efforts were earlier made to facilitate payments through the banking network. However, given the fact that many banks and government departments/agencies were not computerised, this effort only led to delayed collections and reconciliation problems. Moreover, only 2 to 5 percent of the population used this facility. It was against this background that the FRIENDS project was conceived, enabling citizens to visit a single location to pay all bills without the requirement for

back office computerisation in the involved departments/agencies.

2. The planning process

FRIENDS seeks to extend the benefits of fully-fledged computerisation of individual departments to citizens, even before the whole back-end computerisation is completed. The counters are equipped to handle around one thousand types of payment bills (in various combinations) originating out of various public sector departments/agencies. The payments that citizens can make at the counters include utility payments for electricity and water, revenue taxes, license fees, motor vehicle taxes, university fees, etc.

Firewalls safeguard the data from manipulation and other misappropriation. Print outs of transaction details in a particular counter are done on the printer attached to each terminal, on pre-printed stationery. Printing of a receipt for the citizen is done simultaneously with saving of the transaction on the hard disk. The application has provisions for adding more modules and for rolling back incorrect entries without affecting the database even at the user level. The centres are not networked with the participating departments/agencies and therefore the printouts of all payments made are taken and physically handed over to these organizations for processing.

The FRIENDS center in Trivandrum (the state capital) required some US 80,000 dollars-worth of capital investment (including software). This was the pilot center, and has twenty counters. Centers in other 11 districts, which have an average of ten counters, have required an average investment of US 48,000 dollars. The average monthly recurrent expenditure incurred by each center comes to US 1,340 dollars, which includes hardware maintenance charges and payments on account of rent, electricity, etc. These costs are borne centrally by the Department of IT. The salaries of the Service Officers are an additional recurrent cost, covered by those government departments that collect payments at the centers .

Features of FRIENDS system as follows:

- (a) It is a "Single Window Service center" in which the consumer is given the option of paying for the common services rendered to him under a single roof.
- (b) FRIENDS Janasevanakendram is a one-stop Service Center where remittances can be effected quickly.

- (c) The Center works from 9 am to 7 pm (in two shifts) on all days including Sundays. No lunch break (The Center will be closed on other public holidays including Second Saturdays.)
- (d) A computer controlled queue and token management system eliminates the queue and avoids long waiting time.
- (e) Emphasis is given to provide a comfortable ambience to the public.
- (f) There would also be help desks, which would provide information on the remittances.
- (g) There would be a facility to record suggestions/complaints, which will be seriously reviewed on a regular basis and corrective actions taken.

3. The development process

(a) Software development

he software for the centers was developed with ASP, Windows 2000 and SQL RDBMS. One important feature is a provision for adding more modules and a queue management system. Client/server architecture, consisting of a network of one powerful server (Windows 2000 Server/ MS SQL Server 7.0 Pentium III 850 MHz or above) and 10 to 20 normal PCs (Windows 98/Me Celeron 600 MHz or above), is used in each center. The FRIENDS application software is designed to manage the functioning of FRIENDS centers on a continuous basis in two shifts daily” . Kiran (2003) also continues that ”the software can track transactions of remittances, counter balance, users, reports, bank transactions and manage transactions of the different shifts and generate comprehensive reports regarding the same. FRIENDS software is a customized package with a strong and effective database as the back end and an appropriate user-friendly front end to expedite transactions. The software uses ASP, Windows 2000 and SQL RDBMS”.

The FRIENDS application software is designed to manage the functioning of FRIENDS centers on a continuous basis in two shifts daily. The software can track transactions of remittances, counter balance, users, reports, bank transactions and manage transactions of the different shifts and generate comprehensive reports regarding the same. FRIENDS Software is a customized package with a strong and effective database as the back end and an appropriate user-friendly front

end to expedite transactions. The software uses ASP, Windows 2000 and SQL RDBMS.

The main feature of the software is that there is provision for adding up of modules and the easiness of operation even for a nave user. Adequate provisions have been incorporated even at the user level to roll back the incorrect entries without affecting the database. Program is capable of checking redundancies and there by can avoid the duplication of records.

Another outstanding feature is the robustness of the database. Search and retrieval capability of the package also ensures the validity of claims and is also helpful in the identification and correction if some error occurs. Reports can be generated in any form, which is statutory with the various requirements of the MIS divisions of the participating departments. Print outs of transaction details in a particular counter are done on the printer attached to each terminal, on pre-printed stationery. Printing of a receipt for the citizen is done simultaneously with saving of the transaction on the hard disk. The application has provisions for adding more modules and for rolling back incorrect entries without affecting the database even at the user level. The centers are not networked with the participating departments/agencies and therefore the printouts of all payments made are taken and physically handed over to these organizations for processing.

(b) **Partnership**

The FRIENDS project has been implemented by the Information Technology Department, government of Kerala through the Information Technology Mission in collaboration with various departments like the Kerala State Electricity Board, Kerala Water Authority, Bharat Sanchar Nigam Ltd (BSNL), Revenue Department, Civil Supplies Department, Motor Vehicles Department, Universities and the Local Bodies of the State. Center for Development of Imaging Technology (C-DIT), Government of kerala is the Total Solutions Provider(TSP) for the FRIENDS project. At present apart form the Thiruvananthapuram Center, there are Kollam, Pathanamthitta, Alappuzha, Kottayam, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikkod, Kannur and Kasaragod.

The services that were provided by the system include: water charges, telephone bills, electricity charges, payments to civil supplies department, payments to revenue department, payments to local body, payments to motor vehicles depart-

ment, payments to universities software crew.

4. **The Integration process**

Started off as a pilot project in the capital city of Thiruvananthapuram in June 2000. Subsequent statewide rollout started in June 2001. FRIENDS Janasevana Kendram.

5. **The Management process**

The Kerala State IT Mission is the autonomous nodal IT implementation agency for the Department of IT, government of Kerala which provides managerial support to the department's various initiatives. Kerala State IT Mission is a team of professionals from the industry and the government and is headed by the director with the secretary-IT as the chairperson for more details. The entire technical support of FRIENDS is provided by the Centre for Development of Imaging Technology (C-DIT). The C-DIT, is a Total Solution Provider in information technology for the government of Kerala.

Benefits of the projects

The project can be considered largely successful, verging on a total success, considering the direct and indirect benefits and win-win situation provided to both government and citizens. The front-end first approach has been proven as a way forward for e-government. Thiruvananthapuram has been awarded ISO 9001:2000 Certification for its citizen friendly services and quality standards in 2006.

- It has been calculated that, with FRIENDS, citizens need to spend an average of only 35 percent of the cost involved in making separate payments at department counters. By saving on travel costs, costs of using agents, and related costs, citizens using FRIENDS centers therefore make an average monthly saving of about US 1 dollar per citizen. Moreover, on average, citizens save about forty two minutes of their time every month. On average, each center deals with around four thousand citizen transactions per day. The level of satisfaction could be gauged from the fact that 97.4 percent of users prefer FRIENDS to department counters according to surveys undertaken. The increased participation of women customers is also a positive contribution. Moreover, the project in itself was able to convince 80.1 percent of the user-citizens of the possibilities of ICTs

in providing better citizen services. It has also demonstrated that, with appropriate training, skill up gradation and technology, existing government employees can deliver better services.

While the importance of administrative reforms cannot be questioned, it is important to also have a reform strategy delivering quick, high-visibility gains to all sections of society. FRIENDS has managed to accomplish this. It is felt that a sufficiently successful project of this nature would ensure credibility for the use of ICTs in government and will also provide the pull factor for the long-term use of ICTs in government” and adds that ” An average of seven hundred-one thousand people visit each center every day. During 2003-2004, users have increased by more than 75 percent vis a vis the collection in the previous year.

The tables on the next page show the increase in the amount of Lakhs collected and the number of transactions made between 2004 to 2004

Year	Amount collected (In lakhs)
2000-01	567.62
2001-02	5238.57
2002-03	10619.29
2003-04	16000.02

Year	Number of Transactions
2000-01	1,23,709
2001-02	10,26,919
2002-03	20,23,811
2003-04	26,32,137

Table 4.1: Lakh Collection (*adopted from Kerala State IT Mission (2006)*)

4.2.7 Critical success factors for the project

- **The Problem**

As explained in the "earlier problem" notes that as in all Indian states, Kerala has a number of different government and public sector organizations collecting taxes, utility bills, and other fees and payments. Individual citizens have historically been expected to pay at the office of the department or the agency concerned.

- **Software development**

There was much emphasis that was put on software development. The software for the system was developed with ASP, Windows 2000 and SQL RDBMS. It also provided features for additional modules and unique management system as explained earlier in the software development process .

- **Funding**

The fund for this project mainly came from the state government. describes how the fund was used and states that the FRIENDS center in Trivandrum which was a pilot project (the state capital) required some US 80,000 dollars-worth of capital investment

(including software). This was the pilot center, and has 20 counters. Centers in other 11 districts, which have an average of 10 counters, needed an average investment of US 48,000 dollars .

- **Government backing and partnership**

The project has attracted an overwhelming support from the state government, government departments and other partners like Kerala State Electricity Board, Kerala Water Authority, BSNL, Revenue Department, Civil Supplies Department, Motor Vehicles Department, Universities and the Local Bodies of the State. Centre for Development of Imaging Technology (C-DIT), Govt of Kerala is the Total Solutions Provider (TSP) for the FRIENDS project to mention but a few .

- **Pilot scheme**

The project began as a pilot project in the capital city of Thiruvananthapuram in June 2000. and thereafter spread out to FRIENDS Janasevana Kendram.

- **Leadership and management**

As explained in the Management process, pointed out that Kerala State IT Mission is had of a team of devoted experts from the ICT sector of the government and they were led by the director with the secretary-IT as the chairperson . The entire technical support of FRIENDS is given by the Centre for Development of Imaging Technology (C-DIT). The C-DIT, is a Total Solution Provider in information technology for the government of Kerala.

- **Innovation and infrastructure**

It is evident that the center had to be equipped with powerful servers, printers, computers, stationary and software and all the necessary hard and software that was needed. Government of India-owned telecommunications company (BSNL) and most of its infrastructure was used for the project FRIENDS (2005)

- **Security and privacy**

Another exceptional feature is the heftiness of the database its self. Although not much has been written on the security and privacy of the system, there is no doubt that the system was safe and secure and that was why it succeeded

4.3 Best e-government projects/practices in the developed world

4.3.1 Electronic crime report-FINLAND

Introduction

The electronic crime report-FINLAND fulfilled Kreizman and Fraga's (2003) standards, that is why the researcher decided to consider this system for a study.

According to the documentation obtained from Observatory on Interoperability e-government Services(eGovInterop Observatory), (2004) the Finnish Act on electronic Services in the Public Administration, public authorities are required to provide online services as far as they are able. The electronic crime report was built in the framework of the new service strategy for the years 2002-2010". The electronic crime report exploits the electronic form portal of the Finnish public administration (lomake.fi), which was implemented in 1998.

1. Earlier problem

Before this new service, all districts had their own individual Internet services and their own development work. One of the facts is that sparsely populated areas were losing the population and it will become financially too heavy to have policy offices covering the whole geographical area of the country.

2. The planning process

The electronic crime report in Internet is for use in situations where there is no need for immediate emergency services or investigations on the place of the crime. It can not be used if the location (municipality) of the crime is unknown or the crime has been made abroad. The development of the service has been managed by the Ministry of Finance. Electronic crime report main objective was to provide to the citizens an easy way to make a crime declaration especially in cases which do not require a strong identification or an immediate action.

Another objective was to increase the quality of the declarations. A manual process might be too troublesome for minor cases. Electronic declaration can also give more

depth information on the case than an oral interview. Stolen objects can for example be marked by seamless social security number, which every Finnish citizen has and this helps to connect found property with its owner. That kind of information moves over to the local system with fewer mistakes than the old own.

The main internal objective for the police itself was to prepare for the changes in the future, which include better integration with operative systems, more focused services and better cooperation on the back office level. Of course one of the objectives was also better coordination in the police administration. Some of the local police offices already had own electronic declaration services.

The electronic form portal of the Finnish public administration (lomake.fi) that the Electronic crime report exploited had a task of creating a public service that is:

- (a) Interactive
- (b) Easy to use and implement
- (c) Secure and trustworthy
- (d) Wide support for different organizations of different size
- (e) Scalable

3. The development process

- **The lomake.fi portal**

- (a) The lomake.fi service enables electronic transactions between citizens, companies, organizations, central government and local authorities, their agencies and other relevant organizations. The public administration is taking care of the costs and it is free of charge for users.
- (b) lomake.fi further boosts of eight hundred different electronic forms of twenty public sector organizations. Monthly number of transmitted forms is roughly five thousand. The service is also an integrated part of the Finnish public sector service portal called suomi.fi. The administration also provides a users guide to online public services in Finland, which describes the main principles in the use of online services like the political background, data security and privacy. The lomake.fi service includes electronically submitted web-forms and forms to be printed out and sent by post. The web-forms are filled in, signed electronically when necessary, and sent over the Internet.

- (c) For a successfully completed transaction, the service provides a receipt which shows the date and time of the dispatch and the data submitted. The number of web-forms is increasing as well as the number of the organizations participating as a service provider.

The printable forms are in Word and PDF formats, which users can download for printing or fill before the printing. Most of the service can be used without logging. The recipient decides on the need and methodology for logging on a case. At the initial stage logging and the signing of forms are done with an electronic identity card (FINEID card). During the course of year the option of logging with Internet banking codes also become available.

- **Software development**

- (a) **Electronic crime report**

Beside the traditional manual, citizens can give the needed information using Extensible Markup Language(XML)-based electronic form including the information about the municipality, where the crime took place and the claims and requests of the user. When the user has filled and sent the form it will first processed by the lomake.fi portal and after that sent to the XML server of the Finnish Policy. After having recognized the location of the crime, the information will be sent to the Electronic crime report box of the local police office in question. Local police can transfer some parts of the information to the own operational system but fully integration of the investigation system is still under preparation. The information received by police is used for other services, e.g. in case of a stolen mobile phone police informs the operators to prevent the use of this phone with other SIM-cards. There are different forms for the following seven cases: stolen property in general, stolen bicycle, stolen mobile phone, damages (for private persons), damages (for organizations), stolen or lost weapon, stolen or lost document approved by police

- (b) Police invested on XML-parser to receive the messages from the central lomake.fi service and convert them to webforms, which are sent to local Electronic crime report email boxes. The same XML-parser can also be used in other cases so it is hard to estimate the cost to this special case. Also the whole maintenance is done by the own staff and needs seldom actions. Backups and other routines are done by the common automated routines.

(c) Customer side tools are built on common Internet standards (web-browser, Secure Sockets Layer (SSL), Transfer Control Protocol/Internet protocol (TCP/IP). The identification is not done but the validity of the Finnish PIN-code is checked with a calculation. Data integrity, logical checks, conversion to XML-file, temporary storing, timestamps and confirmation of electronic crime reports are done by service provided by common tools of the lomake.fi service. Only XML-conversion is customized to police administration.

(d) **Innovation**

Innovations that were made included:

- Large scale back office integration inside the police organization
- Structure ready to support the implementation of big changes in the future
- Use of the existing infrastructure (like lomake.fi) and the service of a private company
- Easy and fast way for citizen to make a crime declaration without any needless features

(e) **Partnership**

Ministry of Finance financed the whole project. Lomake.fi portal is maintained by a private company Elma Ltd. The Police pays the company based on the number of Electronic crime reports. With 2.000 monthly declarations the cost of the electronic form service lomake.fi is about 450 Euros. This price includes also unlimited number of user IDs in the police administration.

4. **The communication/dissemination process**

After the new service strategy for the years 2002-2010 was ready, the police decided to start with a spearhead case targeted to customers. During the strategy work one district continued to test the electronic crime report system pilot, which suited well with the strategy. Results of the pilot case were encouraging and with slight changes and improving the lomake.fi services it was easy to start without large dissemination project.

Actually new system has not changed the organizations working processes, the lomake.fi system has given the possibility to make the user interface and through XML-conversion it is fit to suit old system, which is not yet renewed. This has led to fast

dissemination of the new service

Because a good feedback from customers side during the pilot phase, it was easy to make the decision. Police will still check the incoming declarations, because they have been trained to understand differences between those notations

5. **The integration process**

The first step in the development was to make a pilot application (in fact two trials in two Police districts). Dissemination is done first after a successful piloting. This has also been a way to find good practices and avoid large scale mistakes. The main issue was to develop adequate web-services for the citizens. The service was easy to market because media was keen to write on it. At the same time also Ministry of Finance was marketing the lomake.fi service. This project did not take the user by surprise, the integration process was quite easy.

6. **The management process**

The case was quite easy to launch because it did differ much from the parallel manual system and the information is same regardless of the type of the form is used. There was no need to train personal for the new web-form system. Guidance was done by sending instructions to all service points. The only new task for duty officers is a regular check of the new electronic crime report email box. Because declarations are not urgency cases it makes possible to do this, when other tasks allow it and the information transfer to the police case system can be done outside the rush time.

Benefits of the project

- **To the Users**

- (a) Main result was a solution, which helps citizens and organizations to make the crime declaration easily and rapidly, anytime and anywhere. Citizens do not need to know the address of the right police office, the name of municipality, where the crime took place, is enough.
- (b) The number of the electronic crime reports during the seven first months rose to 13,200 which was much more than estimated.
- (c) One of the main societal objectives was to provide better services there, where the next police station is far away. In the Finnish situation, this distance can

be hundreds of kilometers. This objective has been reached in principle. The travel time has been saved.

- (d) In the manual process it is quite common that the customer do not have all the needed information at the police station, like International Mobile Equipment Identity (IMEI)-code of the mobile phone or serial number of a certain property. On the web-form, there is a place for all needed codes and other information. In the most cases the customer has this information better at hand when making the online declaration than at the policy station.
- (e) The main evidence is the active use of the service. Misuse is not a problem at all. The service is easy to use and fast with a lot of similarities with a good e-commerce service. It has no interface of bureaucratic or frightening police administration

- **To the police**

- The police is receiving more exact information, for example on the stolen property, which helps to solve the crimes. Also the growth of the number of declarations provides the possibility to have better comprehension on the criminality. It is presumable that the new system will increase the criminality in the statistics. This, on the other hand, increases only the validity of the statistics. Mischievous declarations have not been a problem.
- The Police receives 800.000 crime declarations every year. In the autumn 2003 police received 10 percent of these suitable declarations through Internet, barely seven months after the project was started. The customers find the service useful.
- Reorganization of the back-office. The working time needed to handle an electronic crime report has decreased when the desk service has disappeared. Also the main part of the recording work is now done by the customer. More important result is that the local offices can work with these relative small crimes, when there is nothing going on with higher priorities. It provides better use of always limited human resources. The wanted separation of front and back office has also been successful. The changes in the police organization do not cause the need to make changes to the electronic crime report.

4.3.2 Critical success factors for the project

- **Problem**

It is well explained in the earlier problem that the sparsely populated areas were losing the population and it will become financially too heavy to have policy offices covering the whole geographical area of the country.

- **Software development**

In the software development stage, the Police decided to invest on XML-parser to receive the messages from the central lomake.fi service and transforms them to webforms, which are sent to local electronic crime report email boxes. The same XML-parser can also be used in other cases so it is hard to approximate the cost to this special case.

- **Funding**

There was adequate funding for the whole project from the Ministry of Finance and Lomake.fi portal is maintained by a private company Elma Ltd .

- **Government backing and partnership**

According to the Finnish Act on electronic services in the Public Administration, public authorities are required to provide online services as far as they are able notes , this was an act of parliament and the government had been mandated to offer online services to the citizens. The ministry of finance had partnered with a private company to run the system

- **Pilot scheme**

The pilot scheme for this project was done in two police districts. The rollout is then done after a successful completion of the pilot project. This has also been a way to find good practices and avoid large scale mistakes.

- **leadership and management**

It was not necessary to train personnel on how the system works, instructions were sent to all services points. The only new task for duty officers is a regular check of the new electronic crime report email box . explains

- **Innovation and infrastructure**

Large scale back office integration, use of the existing infrastructure (like lomake.fi) and the service of a private company were among the innovations and infrastructure used for the project . ,

- **Communication**

In fact the new system has not distorted the organizations operational procedure, the lomake.fi system has prearranged the opportunity to make the user interface and through XML-conversion it is fit to suit old system, which is not yet renewed. This has led to fast spreading of the new service .

- **Security and privacy**

Data reliability, rational checks, conversion to XML-file, temporary storing, timestamps and confirmation of electronic crime reports are done by service provided by common tools of the lomake.fi service. Only XML-conversion is personalized to police administration.

4.3.3 BiblioTek DK-DENMARK.

Introduction

BiblioTek DK-DENMARK was also taken up for study by the researcher because of its success, the system has made it easier to access the literature available in all the libraries in Denmark. This system has also met the requirements set by (Kreizman and Fraga, 2003) in chapter 3. Documents written by Andresen (2001)., eGovInterop Observatory (2004) and Lone (2002) about this project was compiled by the researcher as below.

Since late 2000, bibliotek.dk has been giving the general public access to the Danish National Union Catalogue. The Danish National Union Catalogue includes holdings information from nearly all Danish Public Libraries and most of the publicly available research libraries. Users now have direct access free of charge and the ability to send off requests to most Danish libraries.

The formal responsibility for the development of the service was allocated to the Department of libraries of the Ministry of Culture. They choose Danish Library Center (DBC) to develop the system since DBC was already operating DanBib and had significant experience within the library area.

1. Earlier Problem

There were several factors that prompted the start of Bibliotek.dk. Denmark had for a long time had a central register (called DanBib) for all library books available in all libraries in the country. A private company, Danish Library Center (DBC) operated this database, but all libraries did not have the opportunity to use this database in their work. Furthermore the opportunity for the citizen to conduct the search for books him/herself, was considered as a service lift (from a citizen perspective) that could result in productivity gains as more and more citizens identified the books they needed without the help of librarians .

2. The Planning process

From 1999-2000 approximately 13,000 working hours to develop the system (roughly 10 man-years) and the total investment in bibliotek.dk was estimated to 1,17 million Euro. Bibliotek.dk was paid a fixed price for the development by the Department of libraries and are paid an annual fee for operation, development and maintenance of the system. Funding for future development and operation of Bibliotek.dk are specified in the yearly political negotiations of the public budgets. It is the Department of libraries that has the responsibility to allocate this money for DBC. In 2003 DBC received approximately 850,000 Euro to operate the system and the hotline for the system .

The purpose of the initiative was that it should be a supplement to existing services, not something to replace existing services. This is also reflected in the fact that no significant marketing activities have been undertaken and there are no plans to do this either. The rationale and logic behind the service is therefore more user-oriented than motivated by ambitions to create efficiency effects on the level of back offices. In order to provide every citizen in Denmark with equal opportunity for searching, finding and gaining access to information, the libraries shared catalogue of holdings was made available to everyone. It is now possible to request books, articles and other media to be collected from the users own library.

Bibliotek.dk is a service that enables the user to access the total amount of books in Denmark. If the user identifies a book that he wishes to lend he may specify the library that he wants it to be delivered to. The user may use his personnel number to identify himself and secure that he is the one he claims to be. Once the book is collected at the library the user will have to use his library card, or health insurance certificate to lend the book.

A number of Danish libraries have both individually and in teams developed a number of net services. The services, which are of a national character, are included with the list of links on the front page of bibliotek.dk. It also means that the each library in bibliotek.dk has described in precise terms of their service, which is offered to the user. Questions about searching and description of books, periodicals, music etc, as well as assistance in using bibliotek.dk must therefore be directed at the individual users local library. Questions about the individual requisition must be directed at the library which the user has chosen as place of collection.

The libraries receive requisitions from bibliotek.dk in the form of an e-mail (with

human-readable text or structured information) and in a Web based database. Each library chooses its own mode of receipt, which might be different for requisitions from the library's own holdings and potential interlibrary loan requisitions. From the Web based database a user's requisition is then processed by a single click, the service is a very efficient tool. The requisition is then moved to the lending library via a mailbox. Whenever a user orders a book through Bibliotek.dk and selects a library where he wishes to pick it up, it is registered in this library's BOB-base. Employees of the library will frequently enter the BOB base to see which books that have been ordered for pick-up at their library. If books aren't available at their own library, they will use the BOB system as an interface to the DanBib system, where they will identify the nearest library where the book is available and order it from there.

3. The development process

DBC had to develop and implement the system fast. DBC did this by organising the development project in twelve different project groups that worked simultaneously on the projects. The groups would meet one-two hours at a co-ordination meeting once a week where different issues would be discussed. During the fifteen years development period approximately forty employees were involved.

- **Bibliotek.dk**

- (a) That from the beginning of the project DBC used focus groups, mock-up sessions and other tools to involve the end-users of the system. DBC and The Department of libraries were very clear that the real users of the system were the citizens and this led to the continuous involvement of end-users in the development phase. On the basis of this, user panels were selected, partly to outline the requirements for user interface and search facilities. The panels consisted of people of different ages, people in employment, unemployed people, pensioners, women and men. The end users - and not the professional users (the librarians) - wishes and demands in relation to the system have therefore been the most important aspect. DBC today have 8000 users who have agreed to give feedback input to existing functionality and design of Bibliotek.dk. The users subscribe to a mailing list where DBC regularly informs of new development ideas and activities.

(b) In the development of bibliotek.dk, attention was always focused on the end user. The marketing of libraries is an important aspect of bibliotek.dk, but the presentation of the site is not aimed primarily at promoting the libraries, but rather at providing the users with collective access to all the libraries.

- **Virtual Internet Protocol System(VIP System)**

The VIP system was developed in close co-operation with user-group representatives from the libraries. When the VIP system was operable, guidelines for the use the system was sent out to all libraries and a hotline at DBC was set into operation. All libraries then had two-three months to enter their data in the VIP system before Bibliote.dk was launched.

- **BOB base**

The BOB base is the central system in the daily operation of Bibliotek.dk. Employees from libraries were involved in the development in the BOB-base in order to validate the appropriateness of functionality and interface design. At the time the system was developed and implemented DBC employees held a wide range of courses in order to teach as many librarians as possible to use the system. DBC have spend a lot of time on road-shows where they teach librarians how to use the BOB-base optimally.

- **Partnership**

- The Department of Libraries of the Ministry of Culture was responsible for the project development (work control). The decision of the Minister of Culture to open the DanBib database to all Danish libraries was the first and important driver to boost the initiative. It is clear that the legislation was a fundamental driver of success in this case, as well as the strong involvement of the Department of Libraries.
- Throughout the development of the project, groups of librarians have been involved so that they could give input to functionality and design of the system.
- End users (citizens) have also been involved thoroughly in the development project and currently DBC have a mailing list of citizens that are interested in giving new ideas and evaluating existing activities.

4. The dissemination process

In late March and April 2001 an information campaign promoting library services was carried out. A major part of the campaign concentrated on bibliotek.dk. The campaign consisted of:

- Door-to-door distributed postcards
- Banner advertisements on a few Web sites
- Postcards displayed in Cafes etc and in educational institutions
- Half a million leaflets to the libraries

5. The integration process

- (a) legislation and much of the infrastructure and database systems that supported bibliotek.dk was available when the decision to develop the service was taken. This meant that it was an interface to an existing structure that had to be developed, rather than an entirely new service. Secondly, the need for fast implementation in more than two hundred local libraries with different IT systems meant that the new system should be extremely flexible and readily compatible with all the different IT systems in the libraries.
- (b) Users can search on bibliotek.dk on three levels: simple search, advanced search and a blank CCL-screen. After choosing a title, the user must choose a library to collect the material from. The user does not have to select a library to get the material from only where to collect it. This means that one can search on all registered books, articles, CDROMs and other materials, acquired in Danish libraries. There is in total more than 7 million titles, covering several million types of materials
- (c) In the development of bibliotek.dk, no particular technological demands were placed on the participating libraries. Existing library systems were therefore, supposed to be able to be used without further immediate technological requirements and subsequent economic consequences. From the Web based database a user's requisition is then processed by a single click, the service is a very efficient tool. The requisition is then moved to the lending library via a mailbox.

6. The management process

Change management was done by the involvement of librarians and their employees in the various development phases of the project by training sessions, a private company (Danish Library Center - DBC) is in charge of the development and of the implementation of the service. DBC also operates the central register DanBib.

Benefits of the project

- **To the users**

1. All the Danish libraries are connected to this nationwide service. The service has approximately 24.500 unique user per week and the users orders a total of 21.000 books per week. This is a six doubling from 1-1-2001 where the service had been active in a couple of months. The service has fundamentally changed the way that citizens may interact with libraries. They no longer need to speak with expert personnel to locate and order books that arent present at their local library since they can access the entire population of books in Denmark through the Internet and order them. The flexible approach that allowed each library some say in the relation the level of participation in the services that it wanted has also proved to be a success. Most of the libraries that were sceptical from the beginning are now choosing to participate more fully in the project.
2. A years after, shows that "90 percent are very satisfied or satisfied with bibliotek.dk. 96 percent said that they always or as a rule find what they are looking for, and 89 percent find the presentation of the search result easy to grasp or fairly easy to grasp. The respondents answer that they generally find it easy to orientate the bibliotek. selves and navigate in bibliotek.dk. 93 percent say that it is very easy or quite easy to manoeuvre in bibliotek.dk"

- **To the Libraries**

- T The new service has lead to significant changes in the back-office of libraries. First and foremost the traffic and lending generated by the system has meant that many of the employees have had to develop new ICR competencies. In an organizational perspective the introduction of the system has accentuated a

trend towards a de-specialisation of librarians as means to improve flexibility and customer service.

- This services enables them to identify books and their availability status very quick and efficiently in other libraries. This service and its effect has been a significant part of the organizational changes that some libraries have gone through and other libraries will go through in the future. Libraries (especially research libraries) have had a rather high degree of functional and practical specialisation, which meant that organizational flexibility and service orientation was contingent on very good planning on a day to day basis. One of these functions was the responsibility for the identification of books on other libraries when the library itself didnt have the book.
- The new system means that all librarians can perform this function very quickly and thereby existing organizational routines are challenged and being reconfigured. In a longer perspectives the fact that personal can be less specialised and perform the same results should led to greater organizational flexibility and better service.

4.3.4 Critical success factors for the project

1. The problem

There were several factors that prompted the start of Bibliotek.dk. Denmark had for a long time had a central register (called DanBib) for all library books available in all libraries in the country. A private company, Danish Library Center (DBC) operated this database, but all libraries did not have the opportunity to use this database in their work.

2. Software development

DBC had to develop and implement the system fast. DBC did this by organising the development project in twenty different project groups that worked simultaneously on the projects. The groups would meet one-two hours at a co-ordination meeting once a week where different issues would be discussed. During the fifteen years development period approximately forty employees where involved'

3. Funding

Funding for future development and operation of Bibliotek.dk are specified in the yearly political negotiations of the public budgets. It is the Department of libraries that has the responsibility to allocate this money for DBC. In 2003 DBC received approximately 850,000 Euro to operate the system and the hotline for the system

4. Government backing and partnership

The department of libraries of the Ministry of Culture was responsible for the project development (work control). The decision of the Minister of Culture to open the DanBib database to all Danish libraries was the first and important driver to boost the initiative. It is clear that the legislation was a fundamental driver of success in this case, as well as the strong involvement of the department of libraries.

5. Leadership and management

Change management was done by the involvement of librarians and their employees in the various development phases of the project by training sessions and also accepts that a private company (Danish Library Center - DBC) is in charge of the development and of the implementation of the service. DBC also operates the central register DanBib.

6. Innovation and infrastructure

The purpose of the initiative was that it should be a supplement to existing services, not something to replace existing services. This is also reflected in the fact that no significant marketing activities have been undertaken and there are no plans to do this either. The rationale and logic behind the service is therefore more user-oriented than motivated by ambitions to create efficiency effects on the level of back offices.

7. Communication

Since the system was built upon the already existing one, no significant marketing activities have been undertaken and there are no plans to do this either”.

8. Security and privacy

Since Biblio.Tek was built up the existing library systems, there is no evidence of the system being compromised in anyway. The security and privacy of the system must have been strong

4.4 Unsuccessful e-government projects in the developing world

4.4.1 Failed electronic voter registration in Uganda

Introduction

Failed electronic voter registration in Uganda was chosen by the researcher because the system did not fulfill non of its objectives in 2001 presidential and parliamentary elections and has since been considered a big failure. The researcher carried out research in the Uganda electoral commission(EC) using interview questionnaires, documents, archival records and artifacts. In May 1997, Parliament enacted the electoral commission act (1997), which established a permanent electoral commission. The functions of the EC are outlined under article 61 of the 1995 constitution of the republic of Uganda as follows;

- (a) To ensure that regular, free and fair elections are held;
- (b) To organize, conduct and supervise elections and referenda in accordance with the Constitution.

1. The earlier problem

The government of Uganda in an attempt to secure a free and fair election in 2001 decided to introduce electronic voting. The stated purpose behind the system was to do away with impostors who voted in the names of the dead and absentee voters, and also, the system was to check double registration of voters, which was widespread in the country.

2. The planning process

The partners in this process were interim electoral commission, the eligible Ugandan-voters, and all politicians and political parties had a stake in the registration system. The main objective was to hold the first free and fair election process ever in Uganda. The hardware and software equipment were to be imported, experts were to be contracted, and photographic registration was to be undertaken.

3. **The development process**

A total sum of roughly US \$ 22m was invested on the project. The software and hardware were all imported for example the digital cameras that were meant to take voters photographs were imported from South Africa . The photographs were then to be loaded onto a voters' register database. The database was supposed to be maintained on a mainframe (also imported) at the EC headquarters, which would be connected to district EC offices through the Internet. The database would be used as the basis for voter identification at polling stations for the 2001 election.

Reason for its failure

1. **Politics**

This voter registration system failed largely because it was a technical instrument introduced into a highly politicized situation. Some opposition parties claimed that -it was one of the tricks the ruling government wanted to use for rigging elections.

2. **Political will/stuff interest**

A situation in which there was a perceived lack of political will from government to implement the system as intended. The government at first was keenly interested in the project, when some of the equipment that was imported began developing problems, the government showed little or no interest repairing problematic equipment.

3. **Trained staff**

The capacity on the part of the EC to create conditions in which the system would not only be used impartially, but be seen to be used impartially was absent. The commission had ill trained staff both at the grass roots and at the EC itself. When sample voter registers were produced by the system, they were found to be erroneous, with some photographs not corresponding with names of voters- this led the entire exercise to be haulted.

4. **Awareness**

A lack of political awareness on the part of many Ugandan citizens, one respondent confessed that *"some citizens did not know why they were taking photographs"*

5. **Time**

The time that was given for taking photograph was limited. Close to 40 percent of the legible Ugandan voters did not take the photograph

6. **Pilot Scheme**

The system was not tested- there was no pilot scheme ” *a few districts would have been selected as pilot districts for the project*” said one of the respondent at the electoral commission.

7. **Corruption and bribery**

This has been a total failure. Things went wrong at an early stage with the hardware, with criticism that the tenders for procurement of the digital cameras were not transparent, leading to problems with the equipment delivered The equipment- right from the digital cameras to the databases that ran down could not be repaired in Uganda and had to be taken back to South Africa for replacement.

8. **Partnership**

The participation of civil society organizations was not recognized from the inception. The civil service society can have longer-term objectives for improvement of the governance process.

9. **Trust**

The opposition did not trust the system citing that the ruling party had put in mercenaries to work at the electoral commission in the results tally department-though the government would have represented all parties in the process.

10. **Fund**

The government also ran short of funds. When the hardware developed problems- it became very expensive for the government to contain the repair and maintenance costs

4.4.2 Gyandoot: Trying to improve government services for rural citizens in India

Introduction

The Gyandoot project was initially successful, however, it is documented by Bhatnagar *et al.*, (2002) and Gupta *et al.*, (2003) that the projects failed to meet its expectation in a long run as discussed below. The system did not also meet Kreizman and Fraga (2003) standard that adopted by the researcher in chapter 3.

Gyandoot, which means *Purveyor of knowledge* in Hindi, is a government-to-citizen, intranet-based service portal, implemented in the Dhar district of the state of Madhya Pradesh, India, in January 2000. The project was designed to extend the benefits of information technology to people in rural areas by directly linking the government and villagers through information kiosks. The kiosks provide access to a variety of government services, such as registration of complaints and submission of applications for the issuance of certificates and loans. Data on prices of agricultural crops in different markets are also available. Other services set up included: rural e-mail facility, a village auction site, a matrimonial site, an "ask the Wiseman" service for children, an "ask the expert" service for farmers, a village newspaper, an e-education site, and employment news (aimed at semi-skilled workers). The kiosks can also be used free of charge by local government officials, e.g. for e-mail or to exchange health/education data with district headquarters.

Twenty kiosks ("soochanalayas") were initially set up in various rural centres, with each kiosk typically serving a population of Twenty thousand to thirty thousand villagers. A further eighteen privately owned kiosks were added later. Each kiosk was run by a trained operator, and can provide a range of services for a nominal service charge, ranging from around US 0.10 dollars for 'ask the expert' through US 0.20 dollars for registrations to US 0.50 dollars for use of the matrimonial site (many villagers subsist on less than US 2 dollars per day).

1. Earlier problem

In the past, citizens often had to pay bribes in order to have public services performed, some groups (from lower castes, or the disabled) faced discrimination and the humil-

iation of being ignored or their applications rejected, and most faced the prospect of losing a day's wages plus paying transport costs each time they were forced to visit district headquarters.

2. **The planning process**

The stated objectives of the project were:

- To ensure empowerment of the down-trodden segments of the society and to encourage consensus building and enhance transparency.
- Creating a cost-effective, replicable, economically self-reliant and financially-viable model for taking the benefits of information technology to the rural masses.
- Improving the quality, speed and sensitivity of the state delivery apparatus towards the needs of the local citizen.
- Enhanced participation in community affairs and governance through creative use of information technology.
- Implementing a new grass-root entrepreneurial model with participation of groups of non-traditional entrepreneurs”

3. **The development process**

Gyandoot's central hardware based at Dhar District government headquarters consisted of a server with a 450 MHz Pentium III processor, 128 MB RAM, 40 GB disk drive, 2 MB graphics card, 15” monitor, and 48x CD-ROM. kiosk client PCs had a 433 MHz Celeron processor, 32 MB RAM, 4.3 GB disk drive plus floppy, 4 MB graphics card, 14” monitor, and 48x CD-ROM, though specifications for later kiosks were upgraded slightly. Telecommunications was effected using 56kbps modems one each on the client side, five on the server side connected as an intranet using a mix of dial-up lines and wireless in local loop connections. Each kiosk had a dot-matrix printer and a five-hour back-up UPS. The server system runs on Windows NT with IIS server; client PCs run Windows 98. MS SQL Server, Visual Basic, Java Development Kit and MS Access were used to develop the applications, plus an Indian language font set. The system uses Internet Explorer as the main front-end.

Whenever information is required, the kiosk operator (“soochak”) should dial through from the kiosk to the server at district headquarters. All the software applications are menu-driven and Web browser-based. The operator uses them on behalf of the users

who visit the kiosk. These kiosks are located in government buildings or at prominent locations, such as markets, or along the main roads. The central hub is located in the district administrative headquarters at the collectorate. The information on the portal is in the local language, Hindi. Each kiosk provides services to ten to fifteen gram panchayats (village councils) covering twenty to thirty villages and a population of twenty thousand to thirty thousand people.

Partnership

Government officials in Dhar District (especially the Collector) are major stakeholders, as are all the villagers in the District and the kiosk operators. Other stakeholders include senior officials in the Madhya Pradesh government, the IT vendors, designers and implementers, and those intermediaries who profit by interceding between villagers and government, or between villagers and wholesale markets . A nonprofit institution has been set up to manage the project. The National Informatics Center provides technical support and guidance in system maintenance and software development. The funds for the Gyandoot network have come from several sources. The kiosks have been set up through private funding, supplemented with loans provided by public institutions. The networking infrastructure was built entirely by government funds. Private foundations have now come forward to fund expansion of the network.

4. Failure factors

Gyandoot pioneered the idea of rural tele centers in India. The project concept has been replicated by other information and communication technologies (ICT) development initiatives in India. Gyandoot was considered to be very successful in the early years of its implementation, and the project was awarded the Stockholm Challenge IT Award in 2000 for public service and democracy and Computer Society of India/Tata Consultancy Services National IT award for best IT usage in 2000. However, subsequent evaluations have reported diminishing levels of activity, placing in question on the long-term viability of the project. These awards should be seen as justifiable recognition for design innovation, relevance and potential. However, longer-term evaluation shows that the project has fallen well short on all of its admittedly over-ambitious objectives. It should be described as largely unsuccessful. It has identified a model by which transparency of government information and services could be increased, and corruption, discrimination and other costs reduced. It has also made very occasional

progress towards these ends. However, it faces a number of practical difficulties that have constrained the benefits delivered to date.

(a) **Political will/staff interest**

The number of users has diminished significantly in the third year of the project. The initial team of district officers who conceived the idea and implemented it enthusiastically was transferred out. Subsequently, various departments in the district headquarters slowly reverted to their unresponsive attitude to citizens requests for services and complaints. A recent evaluation study reported that the grievance redress system, which was very popular initially, leaves 90 percent of the users dissatisfied in terms of response time as well as corrective action. The dwindling turnout of users has prompted the privately owned kiosk owners to offer additional services such as computer training, photocopying, and public telephones to make up for the loss of revenue. To the extent that these owners focus on more lucrative services, they do not pay as much attention to villagers who seek the traditional Gyandoot services.

(b) **Awareness**

Awareness levels about the Gyandoot system remain relatively low among the villagers, especially among poor and illiterate laborers, in spite of significant media attention and publicity. An evaluation study indicated that (1) nearly 60 percent of non users did not use Gyandoot, because they felt that there was no need to do so; (2) 35 percent were not aware of what Gyandoot had to offer; and (3) 3 percent had heard negative reports about it.

(c) **Trust**

It was intended that land records would be deliverable via the kiosk without needing to involve officials. However, since such records lacked an authorised signature, they were not accepted as an official document by banks and other agencies. The system has thus been adjusted. In some cases applicants merely apply via the kiosk and are then emailed with a date when they can travel to a government office to pick up their land record. In other cases, the record can be printed at the kiosk, but must then be signed by a government official. This may bring some benefits of reduced travel, but the intended disintermediation has not occurred. Indeed, there are complaints that adding the kiosk into the equation has merely added to the complexity and cost of the process.

(d) **Fund**

Costs for the initial system was around US 50,000 dollars paid by the local/village government units. This does not include the set-up costs of the kiosks since the first twenty soochaks funded these costs through bank loans; nor does it include the operational costs which soochaks are supposed to meet from the fees they charge. They should also pay 10 percent of their income to the local government unit. The eighteen later kiosks were set up as private enterprises paid a US 100 dollars annual license fee to the district government. That the kiosks have been made economically nonviable, because infrastructure bottlenecks, such as slow and unreliable dial-up connectivity and an irregular power supply (a six hour power cut is a regular occurrence), have forced additional investments in power backup. Often, the availability of electrical power determines the times during which the soochanalaya can be opened.

Also, there has also been a growth in problems associated with Gyandoot over time, limiting even potential benefits still further. A number of kiosks lie idle for significant periods of time: around one-third appear to be permanently closed; many others are closed for hours or days at a time. Lack of electricity is one cause, as are ongoing telecommunications problems. Limited income and, related, the commitment of kiosk operators is another cause of closure. When kiosks are open, service response times are often poor because hardware capacity is limited, and because several kiosks may attempt to access services at the same time when the electricity comes on.

(e) **Resistance**

Further more, in some communities, particularly those not close to district headquarters began spreading malicious rumours about the project, this has led to a message of unreliability spreading about Gyandoot, further undermining use and sustainability of the service. This vicious circle is strengthened by the fact that some information on the system is not regularly updated. One quarter of users reported sustaining losses in their produce sales because they had based those sales on prices accessed via Gyandoot that turned out to be out-of-date. As a result, usage levels of the kiosks are incredibly low typical usage levels are just one Gyandoot user every two-three days.

(f) **Corruption and bribery**

A majority of Gyandoot's few users seem positive about it, but when asked they see by far the main impact of the project as its improvement of their understanding of ICTs. There is a perception among many users that Gyandoot has reduced corruption, and improved transparency. Yet, at the same time, those users continue to see a need for bribes to be paid.

4.4.3 A Land licensing and planning system for Beira city, Mozambique

The land licensing and planning system for Beira city in Mozambique did not live to witness its benefits to the people of Beira city. The researcher reviewed documents that was written by (Jackson 2002)- and base upon Kreizman and Fraga (2003) standards explained in chapter 3, this system did not match up to the required standard to qualify to be successful.

Land is owned by the state and is divided into plots according to a pre-determined structure plan for the city of Beira. Licenses for the development of vacant land are granted for a token fee on a first-come, first-served basis. Initially, licenses were for two years, after which they are revoked if no significant development has taken place. In most cases, such decisions should be purely administrative.

1. The planning process

Operationally, the computerised application was intended to speed up decision-making by automating the processing of the majority of license requests and revocations, leaving the planning department to concentrate on the few that warrant detailed consideration and negotiation. The application triggered warning letters and license withdrawal notices where legislation and regulations were not being applied. For strategic land use planning, the application provided planners with land use information and trends, enabling them to better predict the future and match developers with suitable plots.

2. Earlier problem

Previously, the land registry consisted of an incomplete and inconsistent paper-based collection of dusty volumes detailing plot usage dating back over a century. No definitive map existed and some showed groups of plots with duplicate or non-contiguous numbering systems and plots overlaying others shown on different maps. Linking plots on the maps with the information in the registry was sometimes difficult, providing insufficient information for both routine licenses and long-term strategic planning. Digitizing the maps and computerizing the registry was a way of updating the system, speeding it up and providing better quality information.

3. **The development process**

The Beira executive council (the local government authority for the city of Beira in Mozambique) initiated the development of a decision support system, with a simple geographic information system interface. The data for the main database was based upon the register of city land plots, their zoning (open space, industrial, residential), and their status (vacant, under development, built on). The application produced information in two forms: a database report with information on plot status, and a digitized map of city plots which spatially represented the database. A common database package was used to hold the database, which was run on two stand-alone PCs linked to a digitization tablet and two printers. A computer mapping/GIS product 'data on the map' was also used.

Partnership

Two temporary stakeholders were the project team, responsible for the design and installation of the application, and the external consultants, responsible for software development. Three permanent stakeholders are the political leadership of the local authority, staff in the planning department, and staff in its subordinate unit, the land registry. A further group of permanent stakeholders are the public and businesses who request licenses to develop land'

4. **Failure factors**

The project failed to influence decision making as anticipated. Whilst land registry and planning department staff were keen, the political leadership was not happy with database results and found that the existing processing system was to its favour. The application can therefore be deemed a total failure. However, the installation introduced computer literacy into the registry and, as an adjunct, greatly increased use of word processing. The external consultants found the technical side difficult, but rode a sharp learning curve and acquired a useful addition to their portfolio.

- **Political will/staff interest**

As the installation progressed the council's political leadership began to see the value of the information emerging. It was seen that licenses were held for prime locations that should have been revoked long ago, and that some license holders

were continually reapplying to maintain control over land they could not yet develop because of lack of capital. Others with capital were simultaneously informed that no suitable plots existed. Further anomalies and irregularities also emerged. Yet behind each case lay a trail of influences and favours involving a spectrum ranging from key figures in the political leadership to low-level clerks.

- **Trained staff.**

The external consultants never quite managed to rid the application of its bugs and operational shortcomings. One big problem was the quality of data input. Operators had difficulty maintaining consistent spelling, spacing and casing of entries. For the cross-referencing to work the application required uniformity of data entry protocols. This constraint was a major blow to the application's defenders and proved fatal to its chances of being adopted.

- **Resistance.**

Political leaders decided against change and the application though installed was never applied to decision making. It stood alone as a parallel information system, waning in relevance with every license decision that was not registered within it.

- **Corruption and bribery**

Automating basic decisions would compromise commitments they had made to applicants in breach of the regulations. Given low basic wages and high inflation the rewards from these commitments provided an important salary supplement that enabled many to make ends meet.

Chapter 5

DISCUSSION OF RESEARCH FINDINGS AND ANALYSIS

5.1 Introduction

The existing frameworks cost alot but still in-effective, the study and analysis of data from successful and un successful e-government cases helps in coming up with a framework which will potential be more successful. This chapter looks at a cross-case analysis that examines projects, categorizing the similarities and differences in each six best projects discussed in the previous chapter and also using constant comparison. Similarities in the success factors discussed in chapter 4 determines the critical success factors for an electronic government project. It helps to achieve the first objective

5.2 Analysis of best e-government practices in the developing and developed countries (Critical success factors)

Amid countries, the psychology and class of implementation differs widely. Yet, far from being unhelpful in terms of considering precisely what e-government is and what it involves, drawing from this uneven evolutionary blueprint we can deduce some helpful lessons permitting us to discover the factors significant for success in all stages - from general awareness to execution says (Bhatnagar *et al.*, 2002).

As pointed out in the methodology, The data from the six e-government projects were subjected to content analysis in which data was coded so as to transform raw data into a standardized form. Data was coded on a cross case table in order to search for pattern or repeatitive occurrence of data as shown in table 5.1 and table 5.2. The table 5.1 next page generates a pattern in the CFS from the six successful case studies. Yin (2004, p.9) explains that *"In collecting case study data, the main idea is to triangulate or establish converging lines of evidence to make your findings as robust as possible"*. Yin (2004) still explaining on triangulation continues that the most preferred result occurs when a number of independent sources all point to a matching set of events or facts. The researcher using cross case-compared and contrasted the success factors of the six best projects. Similar success factors during the design and implementation process therefore helped the researcher to come up with nine critical success factors.

CSF	ETA	ICT4D	BHOOMI	FRIENDS	BIBLIO TEX	ELECTRONIC CRIME REPORT
THE PROBLEM	✓	✓	✓	✓	✓	✓
SOFTWARE DEVELOPMENT	✓	✓	✓	✓	✓	✓
FUNDING	✓	✓	✓	✓	✓	✓
PILOT SCHEME	X	✓	✓	✓	X	✓
LEADERSHIP/MANAGEMENT	✓	✓	✓	✓	✓	✓
INNOVATION/INFRASTRUCTURE	✓	✓	✓	✓	✓	✓
SECURITY AND PRIVACY	X	X	✓	✓	✓	✓
DISSEMINATION	✓	✓	✓	X	✓	✓

Table 5.1: Cross-case pattern analysis

The Pie chart (fig 5.1) next page illustrates the percentage share of each critical success factor had in all the six successful e-government project that was under study. This pie chart helps split into segments the percentages or the relative contribution of each of the CSF to the six projects.

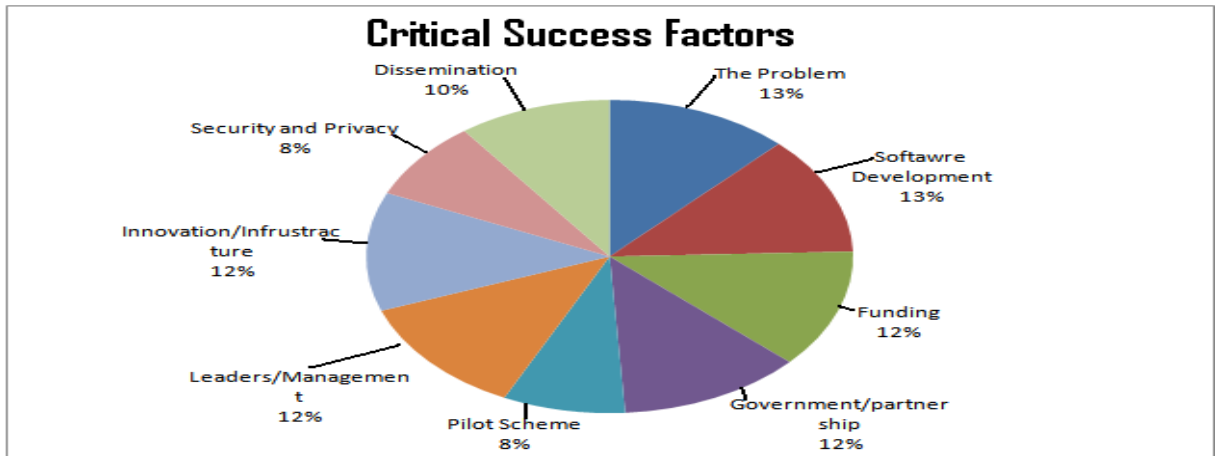


Figure 5.1: A pie chart showing analysis of critical success factors for the six best e-government projects that were under study

The table below represents the number of times each CSF appears in each of the six e-government projects.

Critical Success Factor	Frequency	Percentage
The Problem	6	13 %
Software Development	6	13 %
Funding	6	12 %
Government Backing and Partnership	6	13 %
Pilot Schemes	4	8 %
Leadership and Management	6	12 %
Innovation and infrastructure	6	12 %
Security and Privacy	4	8 %
Dissemination	6	10 %
Total		100 %

Table 5.2: Frequency table.

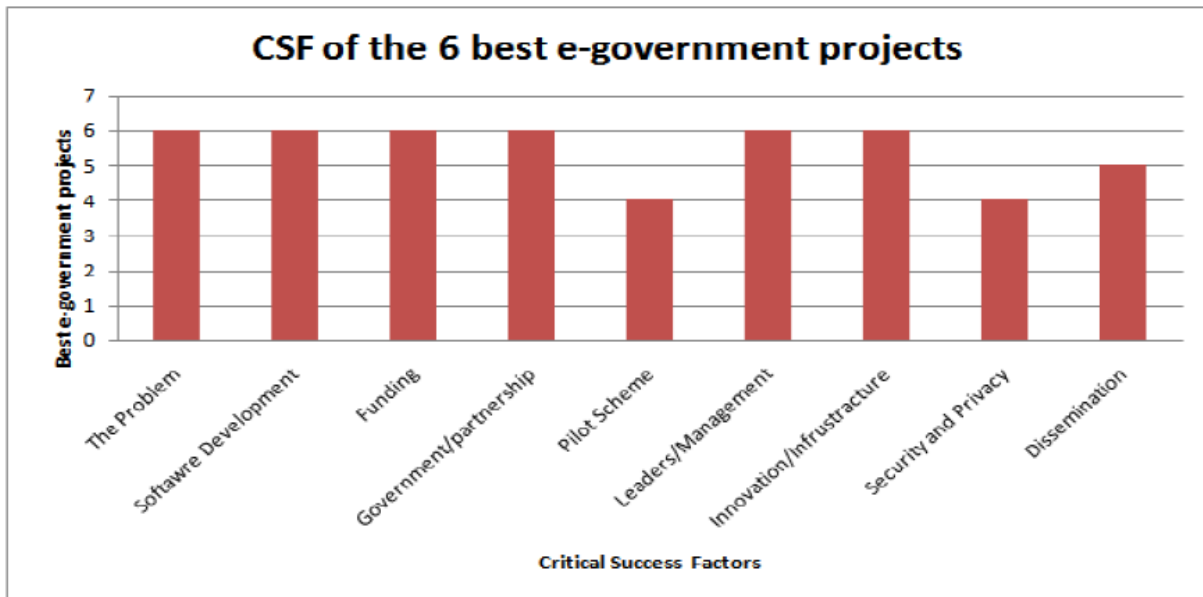


Figure 5.2: A Bar graph- Critical Success Factors for the six best e-government projects that were under study

1. The problem

Before an e-government project is implemented, there should be a big problem that it must solve. The developing world is always synonymous with other pressing problems like AIDS, refugees, epidemic, famine to mention but a few. The problem that e-government is supposed to solve should be so critical that it attracts the attention of the government. Its as a result of this criticality that the government picks up interest and decides to take on e-government. Ndou (2004, p.17) discussed in chapter 2 advises governments to *"Show sensitivity to local realities by assessing and evaluating different alternatives, ways and solutions for digital government development including mobile telephones, kiosks, and multi-channel access to services. Find viable solutions to ensure the effective participation of the community in the information economy"*. When searching for information about government services, is it necessary for citizens to go to government websites?. Or do they prefer to do that by telephone or by an in-person visit?. All of these dimensions mentioned above should be weighed by government before a decision is taken (Kumar *et al.*, 2007). This factor represented 13 % of the critical success factors.

The evidence perhaps shown is when e-voting system in Uganda had to incur huge losses because it did not show the hard pressing problem that was faced by the civil service and needed digital technology. No other alternatives were exploited by the

government. Kreizman and Fraga (2003) in their framework explained that it is harder if there is no holistic vision. They advised governments to initiate authority wide e-government and build up an e-government structural design. Essentially, having a holistic vision answers the question, which business are we really in? A focused operating strategy explains how the service theory will be realized. It also is at this position that the government identifies those vital activities that it must do well to succeed. A triumphant e-government design consists of well-thought-out job design (Affisco and Soliman, 2006).

2. Software/systems development

The study also found out that there was a systematic approach towards software development. There were a set of activities that lead to a software product. Software development included new development, modification, reuse, re-engineering, maintenance etc. The software products especially in the developing countries were designed locally by local experts, incorporating all end-user needs and also had a provision for adding in modules. These software were reliable, user friendly and the interaction was in the local language, had strong robust databases. There were no system quality problems that arose from inadequate perception of user demand and inadequate servicing of their needs. Ndou (2004) in her framework discussed in chapter 2 recommends governments to put in place knowledge management procedures and apparatus to ensure easy usage (i.e storage, usage and retrieval) of strategic information and knowledge for improved and speedy decision-making process. Room should also be created for further adoption and growth of the systems. Spread out participation across hierarchical levels, open feedback systems, and also organize frequent meetings on the system (Carr and Leary, 2007). Software development represented 13 % of total critical success factors.

3. Funding

"Traditionally, the main financial resource for public sector organisations is coming from central government, which is hard to control, and sometimes comes and goes in cycles of feast and famine that make it difficult to plan sustainable IT initiative such as e-government" Ebrahim and Irani (2005, p.605) cites from Heeks (1999) as pointed out in chapter 2. However, in all the six best projects, there was a sum of money or other resources set aside for the project, typical funding that accommodated the

project's growth. For example, the Bhoomi scheme was sponsored by Ministry of Rural Development, government of India, and the electronic crime reporting system in Finland was financed and managed by the Ministry of Finance, ETA in Uganda was supported by the ministry of ICT. There was always ready fund that came from the central government, state governments or other organizations. There was no evidence of corruption and mismanagement of funds. Funding represented 12 % of the total critical factors.

4. **Government involvement and partnership**

Kreizman and Fraga (2003) in their framework claim that a winning e-government approach necessitates the existence of a foundational support structure, policies and procedure. Policies privacy, authentication, Web content management, advertising, fees and payments were some of the ideas forwarded by the scholars. digital policies present the legal foundation for electronic information exchange, payment, and transactions. They are used to institute uniformity between paper and electronic documents, digital signatures, e-banking, verification, and electronic contracts. Therefore, the success of an e-government project and process is vastly reliant on governments role in ensuring a proper legal structure for their operation (Lau, 2003, Schwere and Deane, 2003). Fortunately, all the six best practices had a massive central and local government support. There was also a high degree of partnership with the citizens and the private sector. A cooperative relationship between people, the government and the private sector powered the projects to success. The partners agreed to share responsibility in order to achieve specific goals. The various governments had overwhelming interests in e-government, both the governments and other stake holders were determined to see the success of the projects.

FRIENDS Centers in Kerala for example had over ten government departments and other private organisations that were its partners, the ICT4D in Uganda had Kabissa in USA, I-Network Uganda, Computer Aid International (CAI), African Institute for Capacity Development (AICAD) and International Development Research Centre (IDRC) as partners. As pointed out in Ndou's (2004) framework in chapter 2, collaboration and coordination among ministries, departments and the private sector increases efficiency and effectiveness in process handling, if the barriers and challenges of partnership between the government and international and national organizations and institutions is addressed, e-government will be a success . All government depart-

ments can play an important role in navigating e-government implementation across government, a framework for collaboration across agencies can keep e-government activities aligned (Lau, 2003).

5. Phased implementation

The study also found out that four out of six (66 %) of the best projects had phased/Pilot implementation. The first step in the development was to make a pilot application, and it was from the results of the pilot application that would determine whether the project would be successful. The ability to start small and grow gradually helps in avoiding large scale mistakes. 66 % of the e-government projects had pilot scheme except for the ETA from Uganda and the BiblioTek.DK from Denmark that was implemented countrywide without a pilot scheme. Ndou (2004) in her framework pointed out in chapter 2 advises governments to start on with viable pilot projects, customized to the exact contexts. Starting small and spreading wide will help minimized grave mistakes and losses. Build up gradually putting in mind the challenges and hindrances that lie a head. This method enables the project to manage risks and harness the increasing pressure by systematically building on an accepted success before going the next step (Chevallier *et al.*, 2006).

6. Strong leadership and change management

Robust leadership and strong collaboration governance structures are very significant for attaining successful e-government initiative; employment of connoisseur to over see the project, e-governance should be accentuated. Assignment of power for approving projects or assigning proposal funding can rest in different positions or bodies, and this assignment will be a result of historical issues, jurisdictional culture and management qualities present or absent. An effective public leadership and sustained commitment holds ground for an ultimate e-government success (Kreizman and Fraga 2003, Kumar and Best, 2006) as discussed in Kreizman and Fraga's framework in chapter 2. As far as change management was concerned, changes were realistic, achievable and measurable. The practice of administering changes with the help of tested methods and techniques in order to avoid new errors and minimize the impact of changes was carried out in all the six projects. This was done through hiring experts and consultants, enlightening the end users and retraining the existing staff. It was therefore these well trained teams that also took part in the evaluation and monitoring of the projects.

There was always constant evaluation of the projects to see to it that it was clearly achieving its objective. Change management represented 13 % of the total critical success factors. The complete set of processes employed on these projects ensured that changes are implemented in a visible, controlled and orderly fashion. There are significant organizational factors that include; commitment to use ICT by decision makers, obtaining the essential human resources, instituting appropriate regulatory environment, and developing the capacity to cope with rapid change (NICTPF, 2003).

7. Innovation and infrastructure

The Study also noticed the introduction of new ideas, techniques, services, and practices within the existing system especially from the developed world. The study revealed that two (33 %) of the e-government projects under study had an existing system that was already in place. The electronic crime report exploited the electronic form portal of the Finnish Public Administration(Lamake.fi) for its services in Finland. On the other hand, Denmark had a central register called DanBib for all library books available in the whole country but all libraries didn't have the opportunity to use the data base in their work, Bibliotek which is a government portal was therefore given access to the database(DanBib). Innovation and infrastructure represented 4 % of the total critical success factors. There were no already existing infrastructure before projects from the developing countries were started, They had to build the Infrastructure and then later implement the Projects.

8. Security and privacy

Addressing privacy and security was yet another important factor for a successful e-government project. There need to make sure the system is secure and can be trusted. The research discovered during the study that four best projects had very strong systems that were not prone to attacks. ETA and ICT4D in Uganda had no information on the security of the system.

- (a) System Availability was evident, the systems were available for use by its intended users
- (b) Data Integrity, the information stored on the systems was reliable and could be trusted
- (c) Data Confidentiality, the information stored on the systems was protected against unintended or unauthorized access.

There need to make sure the system is secure and can be trusted. Kreizman and Fraga (2003) in their framework advise governments to address the common problem of privacy and security in the early stages of the initiative. Government has a major role in providing leadership in building a culture of privacy protection and security for its citizens and this can be done through developing a strong public policy as owner and operator of systems and networks, and also as a user of such systems and networks.

9. Dissemination

five out of six (83 %) of e-government projects had a systematic way of distributing information or knowledge to potential beneficiaries of e-government except for FRIENDS e-government project in Kerala India, The purpose of disseminating information/knowledge was to create awareness amongst the citizens so that their decisions, ideas, contributions could be taken note off. The means of dissemination included workshops, meetings, postcards, billboards, radio and television etc. Dissemination represented 13 % of the total critical success factors. Any business will not be recognised and will not make profit if it is not promoted. ICT4D in Uganda demonstrated a strong usage of radios and newspapers as means of creating awareness amongst the local workers/community.

An e-government initiative like any other business needs to be promoted among the citizens. Creating awareness about the initiative will make the project popular. The government could use media house and sensitisation seminars, bills, billboards, banners, business cards to promote the project (Kreizman and Fraga, 2003) claim in their framework. Ndou (2004) also concurs in her framework and insists that for any e-government project to succeed the public should be aware of the initiative and this can be done through Organize workshops, events, seminars, conferences with the sole purpose of creating awareness about the reimbursements that a digital office can create. This collective learning promotes the continuous capacity to adopt innovations brought by e-government (Carr and Leary, 2007) .

5.3 Challenges facing successful implementation of e-government projects in the developing world

Ndou (2004) notes that whilst it is apparent that the adoption of e-government boosts wealth creation and development in an economy, there still awaits many challenges which obstruct the exploration and development of its opportunities. The complexity and diverse nature of an e-government initiative denotes the presence of a number of challenges and barriers to its execution and management.

Through this discussion of challenges, the research will have attained the second objective by ascertaining challenges faced during the design and implementation of e-government. As pointed out in the methodology, The data from the three failed e-government projects were subjected to content analysis in which data was coded so as to transform raw data into a standardized form. Data was coded on a cross case table in order to search for pattern or repeatitive occurrence of data as shown in table 5.2 and Fig 5.3. The table 5.2 next page generates a pattern in the failure factors from the three un successful case studies and Fig 5.3 illustrates percentages of each failure factor.

FAILURE FACTORS	FAILED E-VOTER REG:	GYANDOOT	LAND LICENSING
Politics	✓		
Political will/ Staff interest	✓	✓	✓
Trained staff	✓		✓
Awareness	✓	✓	
Time	✓		
Pilot scheme	✓		
Partnership	✓		
Trust	✓	✓	
Fund	✓	✓	
Resistance	✓	✓	✓
Corruption and bribery	✓	✓	✓

Table 5.2: Failure factors/challenges for e-government implementation in the developing world

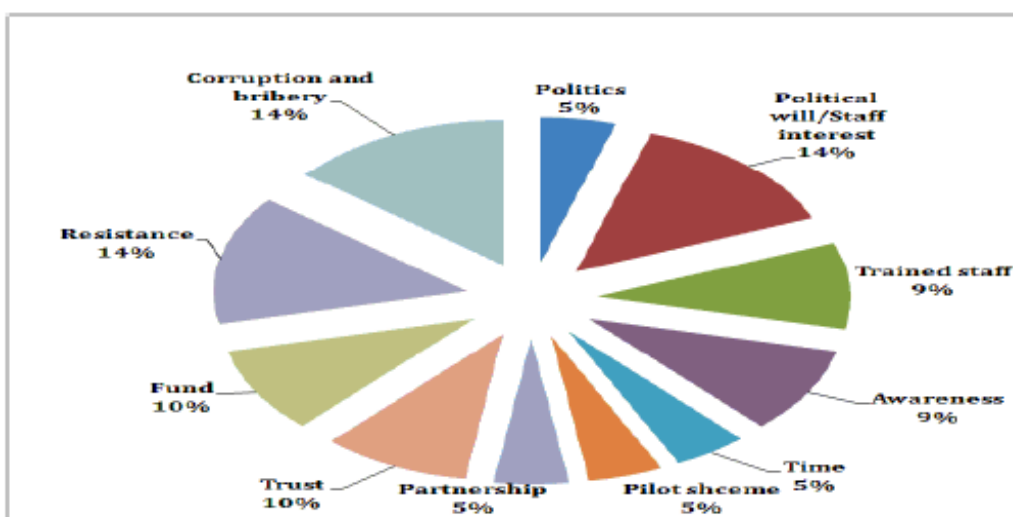


Figure 5.3: Percentages of the failure factors/challenges for e-government implementation in the developing world

The research found out that corruption and bribery, lack of political will/staff interest and resistance were the most fundamental factors that lead to the failure of the un-successful e-government projects that were under study. These factors represented 42% (each was 14%) of all the failure factors. This was closely followed by lack of fund and lack of trust with 10% each. Awareness campaign and lack of trained staff represented 9% each. Pilot scheme, time, partnership and politics represented 4% each

1. **Politics**

There is always a sharp division between the ruling party and the opposition party in such way that what ever developmental project the ruling party initiates, the opposition always criticizes it. For example the voter registration system in Uganda failed largely because it was a technical instrument introduced into a highly politicized situation.

2. **Political will**

There is always lack of political commitment in developing IT sector or ICT projects in the developing world. Most governments dont consider ICT development a priority. The achievement of e-government initiatives and processes are highly reliant on governments responsibility in making an effort to adopt a proper permissible framework for and e-government process. E-government can only be achieved when the legal laws on adoption of digital technology is strengthened (Lau, 2003) . For an e-government initiative to succeed there must be a wide range of rules and polices that govern e-government aspects like e- signatures, Internet usage, data security, crackers, copyrights etc (Ndou, 2004). State laws should be restructured to recognize electronic services (EACS, 2005).

3. **Awareness**

Most governments have a tendency of carrying out little or no awareness campaigns about the project. There was little or no awareness campaigns for either the failed voter registration in Uganda or the Gyandoot project in India. Creating awareness about the initiative will make the project popular. The government could use media house and sensitisation seminars, bills, billboards, banners, business cards to promote the project (Kreizman and Fraga, 2003).

4. **Trained Staff**

The land licensing and planning system in Mozambique and the electronic voter registration in Uganda failed because lacked well trained personnel. As pointed out in chapter four that the external consultants never quite managed to rid the application of its bugs and operational shortcomings and digital camera were quite difficult to operate-respectively. One big problem was the quality of data input. Operators had difficulty maintaining consistent spelling, spacing and casing of entries. For the

cross-referencing to work the application required uniformity of data entry protocols. This constraint was a major blow to the application's defenders and proved fatal to its chances of being adopted. The failed e-voting system in Uganda demonstrated the highest level of in-adequate human capital development. All the photographic digital cameras could not be repaired in Uganda so they had to be taken to South Africa.

The key challenge for an e-government initiative especially in the developing world is the chronic deficiency in digital experts mainly in government departments. The ICT illiteracy rate in most developing countries is generally high. The ratio of a computer to citizen in the developing world is very high and this has left a large proportion of the population as computer illiterates, yet e-government requires highly skilled manpower in its various aspects like developing and installation of the ICT Infrastructure, maintenance, using and managing the system (Ndou, 2004). Moon (2002) as cited by Ebrahim and Irani (2005, p.604) concludes and points out that *"to enhance the effectiveness of e-government practices, public sector organisations would need to move towards a higher level of e-government development, which will require more and highly trained technical staff. Moreover, without fully developing staff capabilities, agencies stand to miss out on the potential customer service benefits presented by technology, so employees must have the training and tools they need to do their jobs"*.

5. **Time constrain/poor planning/strategy**

The time that was given for taking photograph was limited. Close to 40% of the legible Ugandan voters did not take the photograph. This shows this project was not planned in advance. Ndou (2004, p.15) confesses that *"one of the main challenges for e-governments is the establishment of an appropriate and context tailored strategy"*. Yet the advantage is that, having a common wider vision, dynamic strategy and a long-term focus for e-government helps engage and coordinate agencies and government ministries, tie e-government initiatives with broader strategic goals and maintain consistency during the course of the initiative (Lau, 2003 and Ndou, 2004) says as discussed in chapter 2.

6. **Pilot scheme**

The ability to begin small and grow big has always been lacking in most developing countries. There was totally no pilot scheme for the electronic voter registration in

Uganda. Starting small and spreading wide will help minimized grave mistakes and losses. Build up gradually putting in mind the challenges and hindrances that lay a head. This method enables the project to manage risks and harness the increasing pressure by systematically building on an accepted success before going the next step (Chevallier *et al.*, 2006 and Ndou, 2004)

7. Partnership

Partnership is still poorly practiced in the developing world. The failed e-voting in Uganda had not partnered with the private sector, civil society and the opposition parties, this aroused suspicion- discussed in chapter 4. As already discussed in chapter 2 that since developing countries are at the infant stage of e-government, Since developing countries are at the infant stage of e-government, They have not realised the significance of collaboration, yet collaboration among stake holder is very vital for the success of any e-government project, stake holders in the ICT sector do not operate in isolation because this will lead to duplication and interoperability will be difficult. Although collaboration and cooperation are not easy to realise in the developing world, these two aspects must be observed in all levels of the government. Partnership is a significant factor that should be considered when adopting e-government. Apart from the international community, there are very few domestic organisations that can partner with government to build a strapping e-government structure (Ndou, 2004)

8. Trust

As discussed in chapter 4, the opposition parties in Uganda looked at the e-voting system as a governments plot to rig election. lack of authorised signature on records made the masses to loose trust in the Gyndoot system. It was intended that land records would be got through kiosk without needing to involve officials. However, since such records lacked an authorised signature, they were not accepted as an official document by banks and other agencies. Indeed, there are complaints that adding the kiosk into the equation has merely added to the complexity and cost of the process. There need to make sure the system is secure and can be trusted. Kreizman and Fraga (2003, p.1) advised governments to ” *Address privacy and security early in the process*” as noted in chapter 2.

9. **Funding**

The e-voting system in Uganda faced repair and maintenance problem because of inadequate fund. Gyandoot also faced financial problems and cost were shifted to the citizens to cover other costs. In the developing world, the public sectors are mainly funded by the central government. The fund that flows to the public sector is either corrupted or does not flow habitually; the meager fund in some cases is divided to fight civil wars, famine and epidemics. This makes it virtually impossible to realise a steady and fast growth and development of the IT sector in most developing economies and this has been seen by scholars as a major setback for the development e-government in Africa and the rest of the third world (Ebrahim and Irani, 2005).

10. **Resistance**

The e-voting system in Uganda face enormous resistance especially from the opposition parties, the land licensing system in Mozambique and in Gyandoot faced resistance from the corrupt staff. The land licensing and planning system in Mozambique again encountered change management problems, as discussed in chapter 4, though the land licensing and planning system for Beira city was in place, political heads convened and fought against the electronic system and change in general. As noted in the literature review, the employee struggle to strangle the digital office in fear of loosing his or her job is yet one of the biggest challenges faced by digital offices (Ndou, 2004). Digital technology divides, it divides peoples who use ICTs and originated from the digital era and those who do not use technology and did not originate in the Internet age, therefore there is always a challenge of making the citizens cope up with the latest technology because employees who did not originate from the digital era fear change, because in the world over- technology has replaced manpower especially the unskilled manpower and this has been the greatest fear for employees (Ndou, 2004 and Riley, 2004)

11. **Corruption and bribery**

The researcher discovered that there is corruption and bribery in these e-government projects, there were flaws in the procurement process of digital cameras for the e-voting system in Uganda, officials in the land licensing department in Beira city were so corrupt and they thought the computerized land licensing system would put an end to the little bribe they used to get. Gyandoot project was marred with corruption

especially when the initiators of the project were transferred. The fund that flows to the public sector is either corrupted or does not flow habitually; the meager fund in some cases is divided to fight civil wars, famine and epidemics. This makes it virtually impossible to realize a steady and fast growth and development of the IT sector in most developing economies and this has been seen by scholars as a major setback for the development e-government in Africa and the rest of the third world (Ebrahim and Irani, 2005).

5.4 A systematic Approach for e-government adoption in the developing world

The presentation next page introduces the proposed systematic approach for designing and implementing an e-government projects in the developing world. This systematic approach was generated from the studied frameworks in chapter 2, analysed data in chapter 4 and the researcher's own ideas. The uniqueness of this approach is illustrated in its systematic flow of activities, it is also divided in to two phases, i.e *the design phase* and *the implementation phase*. This therefore will help the researcher answer the third objective of the research (To design a systematic approach for designing and implementing an e-government project in the developing world)

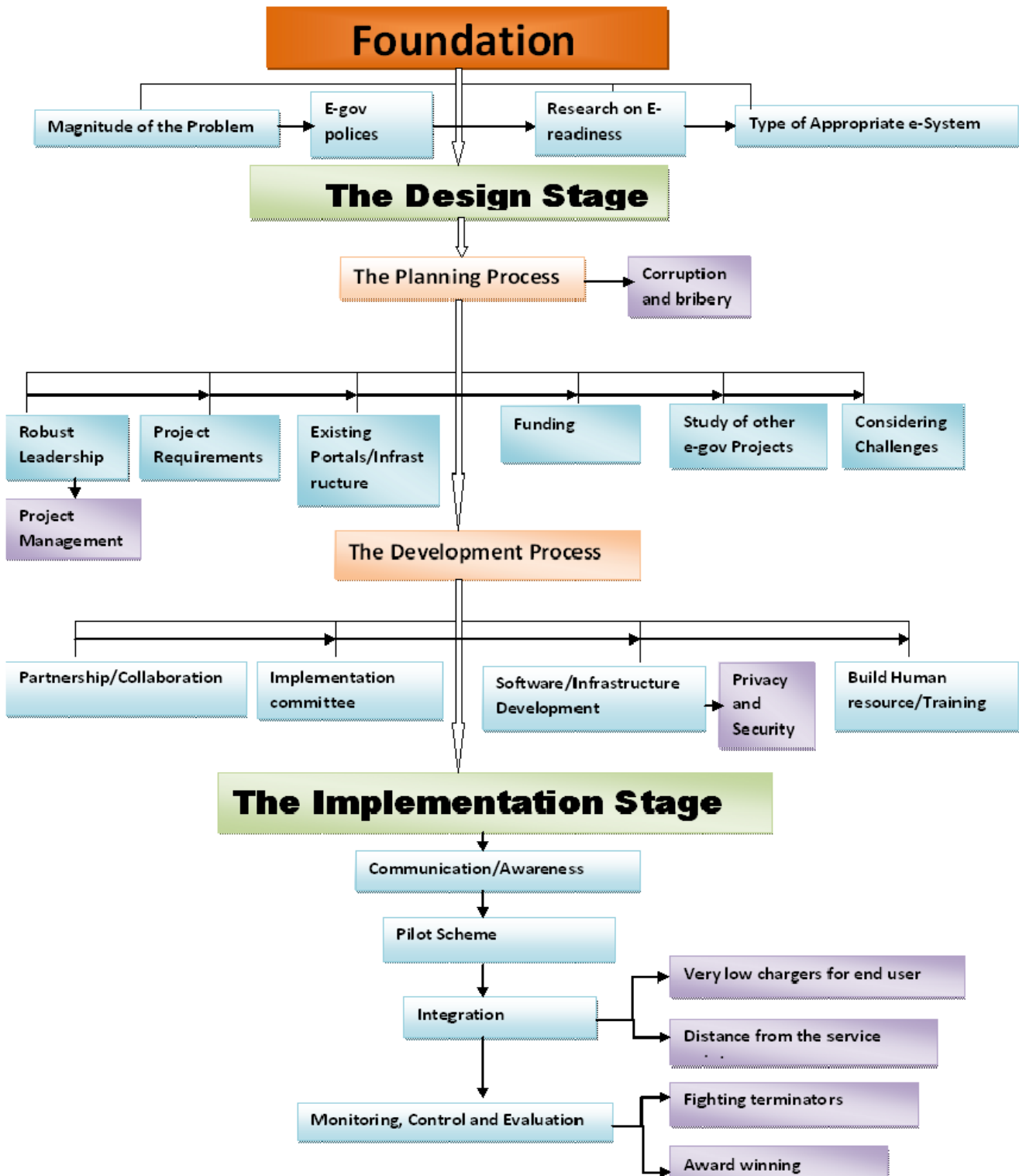


Figure 5.4: A systematic approach in the design and implementation process of an e-government project in LDC- (source: *Researcher's contribution*)

5.4.1 Foundation

The most important aspect to consider when adopting e-government in the developing world is to have what the research termed as " *Fertile ground*". The basis on which the project is grounded, the government should be capable of initiating, sustaining, or supporting an e-government initiative. The platform for e-government adoption in LDC include the following:

1. Problem

Identification of the magnitude of the problem, How big the problem, does it call for an electronic system. As research in the previous chapter shows that there was always a state of difficulty or a problem that needed to be resolved. The problem to be solved by the project should be well defined, it should have been well thought, visualized and quantified. The exact needs to be satisfied by the project should be well defined. Anticipated impact analysis of the projects should be done. Since the developing world is always affected by financial constrains, brainstorming and creating scenarios on how to achieve the desired outcome should be done, this is because brainstorming solutions can generate alternative options. Not every problem can be solved electronically. As the study reveals that there were numerous land problems in Karnataka India, Out dated techniques used by technicians in Uganda, ICT illiterate population in Toro, taxation problems in Kerala, there was no way to share information among libraries in Denmark and the dwindling population in some parts of Finland was making reporting crime difficulty for the citizens and the need to share the state of the art knowledge on various technologies amongst technicians prompted for ETA- ICT chapter. The finding show that all the best projects studied had pressing problem that needed an electronic system (especially for the three best projects in the developing world)

2. e-government policies

After deciding on the option of adopting e-government, there should be the will of the government if any e-government initiative is to succeed, this can be demonstrated through strong e-government policies that act like a fertile ground for any e-government project. A plan or course of action, as of a government, intended to boost e-government initiatives in the country should be sought.

3. E-readiness

After enacting strong e-government polices, there will be a need to determine the level of e-readiness in the country. A survey should be carried out on e-readiness of the population or users. Ndou (2004) in her framework pointed out in chapter 2 says that it is better to begin with e-readiness evaluation which will help the government and other partners to be aware of the existing ICT laws, infrastructure, skilled human resource, funding, partners, computer illiteracy rate and the general reaction of the public towards e-governments adoption. The outcome of the evaluation will be very instrumental in developing human resource, soliciting for fund, creating strong laws, building ICT infrastructure and educating the masses about the up coming venture. Schware and Deane (2003) state that the e-readiness assessment is important because, limited skills of civil servants hinder e-applications, yet also, the absence of necessary e-infrastructure makes it difficult for government to interact with citizens and businesses electronically.

4. Appropriate e-system technology.

The next stage after e-readiness assessment is to determine the appropriate e-system based upon the level of e-readiness in the country. The system should be tailor made to suite the level of e-readiness in the country. Appropriate technology (AT) in other wards is technology that exactly fits or it adequately solves the problem that is at hand.

5.4.2 The Design

- *The planning process*

After the foundation has been layed, it is imperative that the second layer of the project, which is the design stage follows suite. This stage constitutes of the planning process, which the researcher termed "*Planting*". The government should be under task to look out for key aspects that will help in the development process, and these include:

- **Robust leadership/Project management.**

The appropriate technology would need strong leadership to carry it on both politically and technically. Politically, the projects should have a full backing of the

political leaders. Technically, project management is the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives. The primary focus of project management is to achieve all of the project goals and objectives, not forgetting the project constraints usually scope, quality, time and budget. The secondary and more ambitious challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives. In chapter 4, The entire technical support of FRIENDS was provided by the centre for Development of Imaging Technology (C-DIT). The C-DIT, is a Total Solution Provider (TSP) in information technology for the government of Kerala. It is evident from the case studies that all the projects were seriously considered right from politicians to the technical staff.

– **Drawing up the e-government project requirements**

The management and implementation team that consists of consultants and experts should clearly draw up project requirements and determine and identify the tools (capital, equipment, hardware, software), the people (administration, developer, partners, suppliers, customers), state parameters (timescales, budgets, range, scope, territory, authority), state the people involved and the way the team will work (frequency of meetings, decision-making process). Establish 'break-points' at which to review and check progress, and how progress and results will be measured.

– **The existing portals/flat-forms and infrastructure**

The existing system creates a flat form for the project, it reduces the entire budget of the project including the advertising costs. This framework recommends governments to incorporate e-government systems on the existing portals (either private or government renown portals). The ICT4D, the biblio Tek and the electronic crime report were built on already existing portals.

– **Funding**

The total project budget should be known and the funding should be sought. This would provide Funding or capital for the project. This can be provided by the central government, private organisation or International donors. The case studies in chapter 4 reveal that the donors, provisional and central governments immensely contributed towards the funding of the respective e-government projects. ICT4D had developed and maintained many development partners that

financed the project

– **Learning from unsuccessful e-government projects.**

Before an e-government project is implemented, there is a lot to be learnt from unsuccessful projects of the same kind elsewhere. Therefore a good study must be done on those that succeeded. The whole process should be critically studied and analysed. Critical aspects like the literacy level, ICT infrastructure, government conditions, funding and the step by step process of the project should seriously be considered. The Gyandoot project should have taken a critical analytical study of the Bhoomi land licensing system as part of its strategy to succeed. Case studies from other similar projects both (successful and failed) should critically be studied. ICT4D learnt lessons from similar projects in Kenya, Ghana and South Africa

– **Challenges**

The likely challenges of such a project should be identified. There should be any awareness of the potential bottle necks during the design and implementation stages. Remedies for such bottle necks should be well design. Ndou (2004) pointed out that the challenges of adopting e-government in developing countries are numerous and arise as a result of multi-dimensionality and complexity of government initiatives in these developing countries, as the results can be seen through massive failure of most e-government projects.

• *The development process*

This involves the development of various sections of the projects like;

1. **Partnership and collaboration**

This must be built with different private and government institutions. Kreizman and Fraga (2003) in their framework explain that government can then get in to partnership with the private sector and make use of the Infrastructure own by non governmental organisations. The telecommunication industry in the developing world is slowly but surely spreading its root down to the rural areas, government therefore can partner with the private telecommunication sector and share the necessary infrastructure . It is common that countries that have incorporated other partners/stake holders in their planning and implementation of concrete

action e-government plans have seen e-government applications thrive immensely (Schware and Deane, 2003).

2. The implementation committee

The implementation committee should be set up, consisting of experts and well trained staff, that will be answerable to the leadership of the project. The research realised that the ETA had high level steering committee (project implementation committee) which was chaired by the chairperson. the committee consisted of the representative from the ministry of ICT and other partner organisations, heads of all the participating departments. The committee concentrated on issues related to business model, selection of private partner, interdepartmental coordination, business process re-engineering and other important issues in the implementation of the project.

3. Software and infrastructural development

Software and infrastructural development then begins, with emphasis on privacy and security. Selected software developers should be short listed by the consultants in the management team. The software should be design to manage the functioning of the system. The software should be interactive, easy to use and implement, secure, trust worthy and scalable. According to the case studies in the previous chapter, All the softwares used by the successful projects where developed locally. There are a number of qualities that a good software must have and they include:

- (a) There should be continues involvement of end-user in each development phase and the wishes and demands of the end-users should be considered.
- (b) It should reflect the problem it solves.
- (c) It should easily be understood by the customer and it should be user friendly.
- (d) The entire process should be generally short- few steps required
- (e) It should not require much thinking to understand
- (f) It should have little coupling
- (g) The software should be having a provision for adding more modules
- (h) It should have a strong and flexible database
- (i) It must have a users guide
- (j) If necessary, the software should be designed in the local language.

(k) In case of security, the state of the art bio-login matrix system should be employed.

4. **Building human resource**

Mass training on how to use the systems is started. Ndou (2004) in her framework stresses that success of any business let alone e-government principally relies on human skill and potential. Training of staff should be the number one priority and incentives should be given to those that already possess the necessary skills and knowledge. The users of the initiative or system on the other hand should be trained on basic knowledge on how the system works . Training should also spread out to the society including: homes, businesses, schools, etc in order to build human ICT capacity and to decrease on ICT illiteracy levels (Zaied *at al.*, 2007). The NICTPF (2003) framework stressed the need of building human resource, creating an e-knowledge society through ICT training in institutions of higher learning

5.4.3 **The Implementation**

The process of putting the plan in to action, the researcher termed it "*growth*" of the project. The designed and developed project should be put in action. This therefore could be done by:

- **Communication**

Vigorous information campaign should be promoted even before the project is started, the campaign should create awareness on how to use the system, its advantages and how it will replace the traditional method. It should call on to people to support the project. This can be done through

1. Direct out reach
2. Workshops
3. Postcards
4. Radios
5. Television

6. Banners
7. Leaflets
8. Newspapers
9. Magazines to mention but a few.

The research also found out that all the five best projects except for FRIEND had a well structured dissemination process. The two best projects in Europe were built upon the existing system that was already known by the citizen although the Biblio Tek had to be communicated through postcards and fliers. In the developing countries, the projects were mainly communication through workshops and training.

- **Pilot application**

An experimental initiative of the e-government project lasting for a limited time should be conducted, this will help minimize losses incase the project fail. It will also give room for improvement since errors will be detected at the early stage. Incase the pilot experiment succeeds, the project will be systematically expanded. Finding show that four out of the six best projects studied had a phased implementation (Except for the ETA in Uganda and Biblio Tek in Denmark). Pilot scheme helps save massive financial losses in case the project fails.

- **Integration**

The actual integration can be carried out following the successes of the various pilot schemes. This will open up the system for the population to use. Given the availability of e-infrastructure, ICT4D was easily integrated after successful pilot projects were undertaken.

- **Monitoring and evaluation**

Monitoring and evaluation consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary. Monitoring on the other hand determining whether the project meets specified goals or criteria. Monitoring and evaluation also helps measure the on going project activities and variables.

Conclusion

This approach therefore provides a systematic design and implementation practice for e-government project in the developing world. This framework also recognises the ideas of various scholars and frameworks

5.5 Validating the approach

This section answers objective 4 of the research. Questionnaires were distributed to ten experts from Face Technology- an international reputable IT firm, This was done in-order validate the approach. The approach was deemed credible by experts. 100% of the panel of expert has experience of more than five years in ICT related areas. The proposed approach was deemed satisfactory by the experts with average score of **74.53%**. The average score was re-presented to the experts and nine out of ten experts agreed that the score was satisfactory, though one experts gave it a score of 68%. Sections of the approach was validated based on the logical flow of activities and viability of each activity.

Foundation

The research revealed that 85% of the experts believed that included all the components required at the start of an e-government project, 57.5% agreed that the foundation of the approach followed a logical flow, and 85% accepted that the foundation was viable. On average, the panel of expert agreed that the foundation of the approach was 75.83% satisfactory.

Design Phase- Planning stage

57% of the experts agreed that the planning stage reflected a complete planning process, 85% agreed that the planning phase was viable and 60% of the experts agreed that the planning phase had a logical flow. The average score for the planning phase was 67.33%

Design Phase- Development stage

62.5% accepted that the development stage reflected a complete development process, 85% agreed that this stage was viable and 57.5% accepted that there was a logical flow of activities in this phase. On average, 68% of the experts agreed that the development phase was

satisfactory.

Implementation phase

87.5% of the panel of experts agreed that the implementation phase reflected a complete implementation process, 90% accepted that the implementation phase was is viable and 85% accepted that there is a logical flow in the implementation phase. On average, the implementation phase had 87% score. The graph next page show the percentage scores of each of the above explained phases.

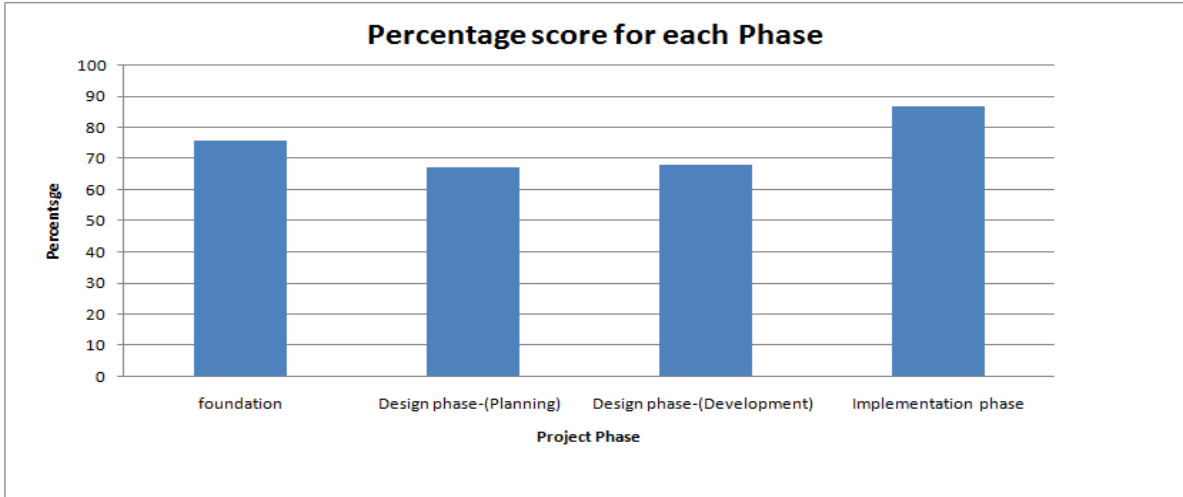


Figure 5.5: Percentages score for each phase

5.6 Conclusion

The research therefore concludes that the approach has proved credible, viable, realistic and complete- as shown by the validation score. The approach can be trusted, can be done with the available means at hand under the common prevailing circumstances in the developing world. This framework is developed after a critical study of various frameworks, success cases and failure cases. The framework was later subjected to scrutiny by a panel of expert- who proved its credibility, viability and completeness

Chapter 6

Recommendations and limitations of the study

The recommendations of this research therefore were derived from the missing gaps in the literature. The gaps were filled from the analysis from the case-studies. The research discovered that missing gaps played a significant role in the success of any ICT project:

1. Charges

There should be no or minimal fee charged on the end-user. There is very little disposable income in the developing world, a high fee on services offered by the project will definitely scare off the users resulting to its failure. If there is any fee charged on the services, then it should be very minimal. The study shows that there were no overhead costs for using the ICT4D system, ETA and Bhoomi system. When using FRIENDS counters, citizens can save up 65 % of the total expenditure a citizen needed to spend of the cost in making separate payments at department counters.

2. Award winning

It is always important to carry-out an e-government project with the aim of attracting recognition, not only from within the country but also internationally. The Stockholm Challenge for example has a well established global networking program for Information and Communication Technology (ICT) entrepreneurs for over ten years. It demonstrates how information technology can improve living conditions and increase economic growth in all parts of the world. One of the main features of the Stockholm Challenge is the ICT prize. The Stockholm Challenge Award, close to one thousand

projects from over one hundred and fifty countries worldwide compete for the award every year. Basically, if the aim of the project is to achieve an international award for best practices, then the project is most likely to be successful. The Bhoomi projects heaped UN public service award for good governance, silver award in Commonwealth Association of Public Administration and Management (CAPAM) innovation awards (2002), Finalist in Stockholm challenge award (2002), Laureate in tech museum awards (2002). The ETA and ICT4D are finalists in the Stockholm challenge award (2008). Having a mind set of winning an international award is likely drive the project to success.

3. The distance to the service point

It is also necessary to bring the service nearer to the people. Sometimes walking very long distances in order to access a service may not course a great relief for the citizens or end-user. A short workable distance to the service point will have saved costs for low income earners in the developing world. When service point is to far from the citizens it was intended to serve, it will discourage the users. The kiosks in Karnataka were established in every sub district (Taluk) and farmers can easily access the kiosks and collect their land records.

4. Fighting the terminators/resistance

It is good to identify workers especially those who have been in the old system, and are fighting to fail the project or the new system, probably because they know that their dubious ways of supplementing their salaries during the old system will be history. Once the new electronic system is initiate, such workers should be identified and taken care-of. It is good practice to take care of workers who are against the system and are not ready for any change or training on how to use the system because of selfish interests. The land licensing and planning system in Mozambique failed because the political leaders fought against change and the land licensing and planning system.

Conclusion

The research found out that the biggest hindrance to e-government adoption in developing country lays in five major factors, that is; corruption and bribery, lack of trained staff, lack of trust in the system, resistance and lack of political will/staff interest.

6.0.1 Methodology/ways of achieving the objectives

The first objective of the research was achieved by reviewing the design and the implementation process (planning, development, communication, integration and management) of the ICT4D in Toro-Uganda, ETA in Uganda, Bhoomi land computerisation scheme in Karnataka, FRIENDS system in Kerala, BiblioTek system in Denmark and electronic crime report in Finland. And the benefits of these e-government projects to the citizens of the respective countries. Failed systems reviewed included failed e-voting systems in Uganda, Gyandoot system in India, and the land licensing and planning system in Beira. The objective was further achieved by identifying and formating the success factors for the each best project.

The second objective was attained by considering challenges faced during the implementation of each of the e-government projects.

The third objective was achieved by developing a systematic approach from a combination of critical success factors of the successful e-government projects under study and various framework that were reviewed.

The fourth objective was achieved by developing questionnaires and distributing them to a penal of experts to validate the approach

6.0.2 Limitation of the study and further research

1. More case studies on unsuccessful projects

Although the objectives of this research were achieved, there were a number of limitations that the study faced. Due to time constraints, the failed case studies from the developing countries were only subjected to the earlier problem, planning process, development process and the reason for the failure. Also more case studies were needed especially for successful projects in the developing world and outside Uganda and India. More unsuccessful cases were also needed and a detail study be taken (The earlier problem, planning process, development process communication process, integration process and management process and the reasons for the failure). Other data analysis methods would have been used to come up with critical success factors.

2. Inadequate data

Some of the places the researcher visited did not provide explicit data due to sensitivity of the information- example in the Uganda electoral commission- though the researcher got data that was necessary for the study

3. More frameworks

More frameworks needed to be studied, this could possibly reduce the research gap identified in the conclusion of chapter 2, but because of time constraints, the researcher studied only six frameworks. Kreizman and Fraga (2003) framework might be meant for a different setting (for the developed world), however, the framework is absolutely relevant to the developing world

4. Case study method

Some researchers may find case study research method not comfortable. Case studies have been viewed in the evaluation and research fields as less rigorous than surveys or other methods. The use of other methods of research may be employed in the future. More sources of data collection should be used in future case study researches. However, as explained in chapter 3, Case study method was the most appropriate methodology for this research. More validation techniques should have been used like, literature studies, case studies, interviews, open ended questionnaires etc.

Conclusion

The way we are governed in the developing countries is undergoing dramatic change, to which the introduction of ICT is making its own powerful contribution, hand-in-hand with other societal trends. These new technologies can help public administrations cope with the many challenges. However, the focus should not be on ICT itself. Instead it should be on the use of ICT combined with organizational change and new skills in order to improve public services, democratic processes and public policies. In this research, the researcher has investigated selected case studies on e-government projects, and there after developed an approach for a systematic design and implementation practice tailored for the developing world. E-government when designed and implemented using the researchers approach will to a larger extend succeed.

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6.1 APPENDIX 1

6.1.1 Questionnaire and Interview guide

INTERVIEW GUIDE- FOR CHAIRPERSON/DIRECTORS AND DIVISION HEADS/EMPLOYEES

In the current era of technological advancement that is taking place all over the world, anew kind of rationalization has been introduced in the public sector by the use of modern Information and communication technologies (ICTs).

1. Name of the organization/Association
2. Gender a) Male..... b) Female.....
3. What is your current position in the association.....

Research Question: The structure of a successful e-government project

4. When and why was the association/organisation formed/started?.....
5. Why did the association/organisation employ ICT for its services?.....
6. What was involved in the planning and development stages of the system?.....

Research Question: Factors are responsible for the success and failure of an e-government project.

7. Do you consider the project a successful?.....
 - a) If no, why?.....
 - b) If yes, what are the factors responsible for its success?.....

Research Question: Benefits of e-government.....

8. Have you benefits from this project.....
 - a) If no, why?.....
 - b) If yes, what are the benefits of this system to you as an individual and to the organization/ association as a whole?.....

Thank you

OPEN ENDED QUESTIONNAIRE- FOR MEMBERS (TECHNICIANS/COMMUNITY WORKERS)

In the current era of technological advancement that is taking place all over the world, anew kind of rationalization has been introduced in the public sector by the use of modern Information and communication technologies (ICTs)

- 1. Name of the Organization/Association
- 2. Gender a) Male..... b) Female.....
- 3. Do you hold any position in the Association/Organisation?
i) Yes..... ii) No.....
- 4. When and why did you trained at the Association/Organisation?
.....
.....
.....
- 5. Where you involved in the planning and development stages of the ICT-project? i) Yes..... ii) No.....

Research Question: Factors are responsible for the success and failure of an e-government project.

- 6. Do you consider this ICT- project a success?
i) Yes..... ii) No.....
a) If no, why?
.....
.....
.....
.....
- b) If yes, what do you think are the factors responsible for its success?
.....
.....
.....
.....

P.T.O

Research Question: Benefits of e-government/Project to the technicians/community workers

7. Have you benefits from this project/training?

a) If no, why?

.....
.....
.....
.....

b) If yes, what are the benefits of this project/training to you as a person

.....
.....
.....
.....

Thank you

INTERVIEW GUIDE- FOR CHAIRPERSON/DIRECTORS AND DIVISION HEADS/EMPLOYEES OF UGANDA ELECTORAL COMMISSION (EC)

In the current era of technological advancement that is taking place all over the world, anew kind of rationalization has been introduced in the public sector by the use of modern Information and communication technologies (ICTs) in Election.

1 Gender a) Male..... b) Female.....

2 What is your current position in the EC.....

3 How long have you worked with thw EC.....

Research Question: The structure of a successful e-government project.

4. When and why was the EC formed/started?.....

5. Why did the EC employ electronic registration before 2001 elections?.....

6. What was involved in the planning and development stages of the system in 5 above?.....

Research Question: Factors are responsible for the success and failure of an e-government project.

7. Do you consider the electronic registration system successful or a failure?.....

8 What were the factors responsible for its success or its failure?.....

Thank you

VALIDATION QUESTIONNAIRE

The systematic approach below was design to guide government or any other institution to design and implement a successful electronic government project/initiative. A thorough study and analysis is required and the following questions be answered.

Scale: 1- I dont Know, 2- I dont Agree, 3- I Agree, 4- I Stronly Agree

1. Name of the organization.....
2. In what age group are you?
 - a) 19 and under..... b) 20-29..... c)30-39..... d) 40-49.....
 - e) 50-59..... f)60+.....
3. Gender
 - a) Male..... b)Female.....
4. In terms of your current occupation, how would you characterize yourself?
 - a. Chief Executive Officer / MD
 - b. General Manager
 - c. Chief IT Officer
 - d. Technical Support PersonnelOther, please specify.....
5. How long have you worked or dealt with IT implementation issues.
 - a) Less than a year..... b)1-5 years..... c)more than 5 years.....

6 Foundation

- a) On the scale of 1 to 4- do you think the foundation of this approach is complete and captures all the necessary aspects needed before adopting an e-government initiative?.....
- c) On the scale of 1 to 4, does the foundation exhibit a logical flow of activities?.....
- d) On the scale of 1 to 4, grade the viability of the foundation phase.....

7 The design phase

The design phase of this approach is divided in two components, the planning stage and the development stage.

(A) Planning stage

- i) On the scale of 1 to 4- does the planning stage reflect a complete planning process?.....
- ii) On the scale of 1 to 4, grade the viability of the planning stage.....
- iii) On the scale of 1 to 4, grade the logical flow of the activities in the planning phase.....

(B) Development phase

- a) On the scale of 1 to 4- does the development stage reflect a complete development process?.....
- b) On the scale of 1 to 4, grade the viability of the development stage.....
- c) On the scale of 1 to 4, grade the logical flow of the activities in the development phase.....

8 Implementation

- i) On the scale of 1 to 4- does the implementation phase reflect a complete implementation process?.....
- ii) On the scale of 1 to 4, grade the viability of the implementatio stage.....
- iii) On the scale of 1 to 4, grade the logical flow of the activities in the implementation phase.....

THANK YOU