



UNIVERSITY OF NAIROBI
SCHOOL OF COMPUTING AND INFORMATICS

**A FRAMEWORK FOR POST-IMPLEMENTATION
EVALUATION OF E-GOVERNMENT SYSTEMS IN
KENYA – A CITIZEN CENTRIC APPROACH**

BY:

JOSEPH K. IRUNGU

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SUPERVISOR:

MR. JOSEPH OGUTU

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THE REQUIREMENTS OF MASTERS OF SCIENCE IN
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DECLARATION

I, **Joseph K. Irungu**, do hereby declare that this research project is entirely my own work and where there's work or contributions of other individuals, it has been dully acknowledged. To the best of my knowledge, this research work has not been carried out before or previously presented to any other education institution in the world of similar purposes or forum.

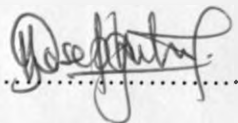
Signature.....

Date.....29/07/2011

Joseph K. Irungu

P56/71506/2007

I do hereby certify that this project has been presented for examination with my approval as the University of Nairobi Supervisor.

Signature

Date29/7/2011

Mr. Joseph Ogutu

School of Computing and Informatics

University of Nairobi, Kenya

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Abstract

The e-government field is growing to a considerable size, especially in developing countries as government seeks to make use of ICT to serve its citizens efficiently and effectively. E-government projects cost are enormous and therefore it becomes imperative for governments to continuously evaluate these projects with a view of identifying the benefits and improving the quality of services they offer to the citizens.

Like the evaluation of all other information systems initiatives, the evaluation of e-governments in both theory and practice has proved to be important but complex. The complexity of evaluation is mostly due to the multiple perspectives involved, the difficulties of quantifying benefits, and the social and technical context of use.

In this research, existing frameworks for e-government software projects evaluation were analyzed with the aim of developing an evaluation framework for e-government systems with the citizen as the central focus. The main aim of this paper is to investigate the citizen's perspective in evaluating e-government services, and present a set of evaluating factors that can be used in evaluation of e-government systems. The research identified four main groups for evaluation of e-government system; financial, social, technical and delivery platform (in our case, website) and developed specific factors to measure these four groups with a consideration of the level of e-government in Kenya.

Two cases were considered in the evaluation of e-government services: Kenya Public Service Commission Online Recruitment and Selection Database System and Kenya Revenue Authority New Taxpayer PIN Registration Online System. A sample of e-government services users of these selected cases were randomly obtained and self administered questionnaires were sent to them. The research found out that 1.46% of the respondents were very disappointed, 4.89% were disappointed, 41.46% were slightly satisfied, 33.17% were satisfied and 19.02% were very satisfied with the online job application system. In the case of new taxpayer PIN registration, none of the respondents were very disappointed while 15.71% were disappointed, 24.76% were slightly satisfied, 56.19% were satisfied and 3.33% were very satisfied. None of the two systems was available throughout as it is supposed to be in e-service provision. KRA new taxpayer PIN online registration fared better than PSC online job application with 13.33% of the respondents indicating that the KRA e-service is always available as compared to 0.49% in the online job application service.

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List of Abbreviations

ABBREVIATION	DESCRIPTION
ICT -----	Information Communication Technology
IS -----	Information System
IT -----	Information Technology
POUe -----	Prior Operational Use evaluation
OUE -----	Operational Use evaluation
CRM -----	Customer Relationship Management
EVA -----	Economic Value Added
NPV -----	Net Present Value
ROI -----	Return on Investment
KPA -----	Key Performance Area
KPI -----	Key Performance Indicator
CCP -----	Content Context and Process
TAM -----	Technology Acceptance Model
PSC -----	Public Service Commission
KRA -----	Kenya Revenue Authority
ISP -----	Internet Service Provider
TAM -----	Technology Acceptance Model
WCAG -----	Web Content Accessibility Guidelines

CHAPTER ONE

INTRODUCTION

1.1 Background Information

E-government is defined as government owned and operated systems of information and communications technologies that transform relations with citizens, the private sector and/or other government agencies so as to promote citizens' empowerment, improve service delivery, strengthen accountability, increase transparency, or improve government efficiency World Bank, 2001. Successful implementation of e-government projects enable governments to provide services in an efficient and effective manner.

ICT has opened up a new realm for business development in the last decades and now governments all over the world have also seen the opportunities and benefits that ICT may bring in. Many governments have initiated and implemented e-government projects that have costed significant amount of money. The government of Kenya has not been left behind in implementing e-government projects regardless of the fact that developing countries like Kenya have budget constraints. Over the last few years the Kenyan Government has massively invested in e-government projects. A project, by definition, is a temporary activity with a starting date, specific goals and conditions, defined responsibilities, a budget, a planning, a fixed end date and multiple parties involved. E-government software project (e-government system) involve planning, designing, and implementing projects of software nature. A tour of government ministries/department shows that e-government has been adopted and some ministries/departments are making use of ICT systems and infrastructure to serve their clients. Some of these e-government projects that the government has carried out are:

- i. Online Selection and Recruitment Database System
- ii. Online Tax Returns
- iii. Online Exams Result and Form One Selection
- iv. Online Tax PIN application

There is a need to carry out some evaluation on these projects to determine their benefits to citizen and improve them where necessary. Evaluation is systematic determination of merit, worth, and significance of something or someone using criteria against a set of standards. E-government projects evaluation can be carried out before, referred to as Prior Operational Use

Evaluation (POUe), ex-ante, formative, or Prior-Implementation Evaluation. POUe is a predictive evaluation performed to forecast the impact of the project. This type of evaluation is carried out prior the system becomes into operational use –through the development stages of IT/IS- to justify the investment (Al-Yaseen et al, 2010). Evaluation can also be carried out after implementation, that is, when the system becomes into operational use referred to as Operational Use evaluation (OUe) (Al-Yaseen et al, 2010). This type of evaluation draws on real rather than projected data, and can be used to justify adoption, estimate the direct cost of the system, estimate the tangible and intangible benefits of the system, ensure that the system meets requirements, measure the system effectiveness and efficiency and estimate indirect costs and other costs. It is imperative for the government to carry out a reflective assessment of e-government software projects from the citizen's point of view. This study endeavours' to identify citizen focused evaluating factors for e-government software project evaluation in a developing country like Kenya. The research also involved carrying out post implementation evaluation of selected e-government system. One of the critical issues for the researcher is how to evaluate these projects with a citizen centric approach.

This study researched on the existing frameworks of e-government software projects evaluation and identified the most appropriate evaluation parameters that fit the Kenyan situation. The study also came up with a framework for evaluating e-government software projects in Kenya and validated it by carrying out an evaluation of the selected e-government systems.

1.2 Problem Statement

Kenya is a developing country and therefore as it is with other developing countries it has limited resources. Many sectors of the economy compete for these scarce resources as the government tries to allocate them in areas that will have the highest impact both financially and socially. The government of Kenya has in the recent past invested in e-government projects. These projects require huge outlay of initial capital both in terms of finance, time and human capital.

Due to the high costs and risks involved in implementation of e-government projects, it is important to take appropriate measures to ensure successful implementation of the few e-government projects the government funds. In its first survey, the Standish Group's CHAOS survey, it was estimated that only 18 percent of all software projects were considered successful, 31 percent were failures and 53 percent were challenged. These figures could be even high in developing countries. To ensure that only viable e-government projects are funded a culture of performing ex-ante evaluation need to be cultivated in the public service. This ex-ante evaluation need to be followed by post implementation evaluation of these implemented e-government projects to justify adoption and investment in e-government projects. However this is not the practice in government today. Adoption of an evaluation culture in developing countries would positively contribute in enhancing success of these systems and increase citizen utilization of e-government systems.

This study therefore sought to develop a post implementation evaluation criteria that fits Kenya and carry out a post implementation evaluation of selected e-government software projects in the Kenyan government.

1.3 Research Objectives

The objectives of this research include:

- i. Investigate the existing frameworks for evaluating e-government software projects
- ii. Investigate the citizen' perspective in evaluating e-government services, and present a set of evaluating factors that can be used in evaluation of e-government services
- iii. Propose an appropriate framework for performing post implementation evaluation of e-government software projects in Kenya.
- iv. Perform a post implementation evaluation of selected e-government software projects in Kenya.

1.4 Research Questions

- i. What parameters can be used to evaluate of e-government software projects from citizen perspective
- ii. Do existing frameworks sufficiently cover all parameters of evaluating e-government projects
- iii. What evaluation parameters are best suited for the Kenyan situation

1.5 Project Justification

Evaluation in e-government systems is important in justifying ICT investment, in gauging the actual ICT impact on business/government performance in contribution to organizational learning, in improving future decision making and in optimizing system use. So far a number of e-government projects have been implemented in the Kenya government institution and it is imperative to evaluate them in order to justify their adoption, justify investment made on them and improve the online services they provide.

A robust evaluation and monitoring of the costs and benefits of e-government needs to be better incorporated into e-government planning and investment. That is, e-government need to be supported by a strong business case without which e-government implementers will find it increasingly difficult to obtain support for making the investments required to enable them to achieve the objectives that governments set for them.

In a developing country like Kenya where resources are scarce, the framework developed in this research can be used to assess e-government systems and use the findings to justify investment made, improve these systems to maximally satisfy the citizens and in so doing increase their citizen utilisation. These will eventually enable ICT champions to build business case for bigger ICT investment.

The entrenchment of e-government systems evaluation culture in the early phases of e-government will go a long way in helping developing countries progress faster and avoid loopholes in this field. It will also encourage the government to invest more in ICT as most citizens will enjoy better service delivery provided by these e-government systems. It is in this light that this project finds its footing in alleviating the problem of ICT systems failure, justification in ICT funding and adoption.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

One of the critical issues faced by researchers and governments is how to evaluate and assess the successfulness (and therefore impact) of e-government projects. The traditional value assessment methods existing in the business field are not good enough to cope with the issue, as business and government hold different value perspectives and have different concerns (J. Liu et al, 2008).

While assessing value of e-government projects, most people's first reaction is to relate it with commercial interests and evaluate it with monetary terms – how much money does a company make/lose? Indeed, money is the main equalizer of the private sector valuation. Most private sector valuation forms are inevitably related with the economic value and measured in monetary terms. Businesses use a sophisticated set of techniques to measure and manage value. Profit, revenue (turnover), cash flow, economic value added (EVA), net present value (NPV), and return on investment (ROI) are all possible mechanisms for business valuation. However, when talking about value in the public sector, the assessment issue becomes much less straightforward, as private businesses and public sectors hold different value perspectives and have different concerns (economical, political, social etc.) (J. Liu et al, 2008).

Like the evaluation of all other information systems initiatives, the evaluation of e-government in both theory and practice has proven to be important and complex. The complexity of evaluation is mostly due to the multiple perspectives involved, the difficulties of quantifying benefits, and the social and technical context of use. The importance of e-government evaluation is due to the enormous investment put in by governments for delivering e-government services and to the considerable pace of growing in the e-government field. However, despite the importance of the evaluation of e-government services, the literature shows that e-government evaluation is still an immature area in terms of development and management (Alshawi et al, 2009). Farbey, Land, and Targett (1993) classified a number of IS evaluation approaches, which included quantitative methods that used tangible or direct costs and benefits and qualitative methods that accounted for intangible or indirect cost and benefits, from the organizational and human perspective. In contrast, the evaluation of e-government has proven to be even more complex as an accurate evaluation

requires consideration of multiple perspectives of the stakeholders and the social and technical context of use. To overcome the complexity and difficulty of e-government evaluation, Alshawi et al (2009), suggests that it is necessary to address and consider three main challenges for developing an evaluation framework for e-government systems. These challenges are:

- Investigation of various perspectives (Jansen, 2005), which may not only require addressing and meeting the general needs of a target group such as citizens, but also require including the specific needs of the specific target groups of citizens which are using a particular e-government service such as unemployed persons, families, pensioners, architects, lawyers, students, and so forth.
- Identifying and quantifying benefits. Beynon-Davies (2005) stated that it is difficult to determine the precise benefits associated with e-government. In practice, as e-government initiatives are different in their goals and objectives, the benefits gained by these initiatives will be different as well, and the assessment of these benefits also varies according to the different perspectives of the stakeholders on the value of these benefits.
- In evaluating e-government is the fact that, for the evaluation to be proper, it should consider the social and technical context of use. This is a result of the opinion that Information Systems research and the e-government evaluation as a part of it are as much a social science as an Information Systems science (Mingers et al, 1997).

Some researchers argue that the suitability of an evaluation approach depends mainly on the information system and the organisational context. For example, Khalifa et al. (1999) stated that there is no single IS evaluation approach that can be applied to all situations. Farbey et al. (1993) added that IS evaluation can contribute to the success of the information system when the appropriate approach is applied to the appropriate organisational context.

One of the factors to consider when determining the evaluation criteria to adopt in evaluation of an e-government system is the level of e-government phase a country falls in. There are four phases of e-government implementation according to evolution of an e-government strategy by the Gartner Group (Gartner Group, 2000). This model can be used to determine where an e-government project belongs to and hence adopt the relevant evaluation criteria. These phases are; -

Phase 1: Information/Presence

This first stage of e-government development is characterized by the existence of a presence on the Internet. During this first phase, the Internet sites are rather static in nature and are only

meant to provide general information.

Phase 2: Interaction

This second stage of e-government development is characterized by Internet sites that provide search capabilities, host forms to download, and provide links to other relevant sites. In most instances, this stage enables the public to access critical information online and get some services online.

Phase 3: Transaction

This third stage of e-government development is characterized by empowering the public to conduct and complete entire tasks online. The focus of this stage is to build self-service applications for the public to access online which include payment of these online services electronically.

Phase 4: Transformation

The fourth stage of e-government development is characterized by redefining the delivery of governmental information and services. This phase relies on robust customer relationship management (CRM) tools, wireless access devices and new methods of alternative service delivery capabilities that reshape relationships between citizens, businesses, employees and governments.

2.2 E-government Projects Evaluation Frameworks

E-government evaluation can be broadly classified in to two; Traditional models and others which try to incorporate benefits and costs of e-governments to users which are not easily quantifiable. The most commonly used evaluation approaches are the traditional ones. They focus return on investment, cost/benefit, payback period, and present worth (Alshawi et al, 2009). Using traditional approaches can be problematic in evaluating e-government investment. The problems in these approaches include the limited definition of stakeholders, the targeting of only direct tangible costs and benefits, and the fact that investments are based on accounting and financial instruments. Lie et al, Marian C. Alshawi et al, all agree that traditional approaches are based on narrow technical and accounting terms, ignoring human and organizational components of e-government users (the citizens) and they run the risk of not identifying all the hidden costs and intangible benefits generated from system users.

Below are some of the frameworks considered.

2.3 An Integrated Value Assessment Framework

This is a framework that integrates both traditional evaluation approach that lean on financial aspect and other approaches that lean on intangible benefits and cost. This framework was produced by Liu et al.

This framework defines four categories of values:

1. Financial value implies impact on current or anticipated income, asset values, liabilities, entitlements, and other aspects of wealth or risks to any of the above.
2. Social value implies impact on society as a whole or community relationships, social mobility, status, and identity. Social and psychological returns include increased social status, relationships, or opportunities; increased safety, trust in government, and economic well-being.
3. Operational (Foundational) value implies impact in realized operations and processes and in laying the groundwork for future initiatives.
4. Strategic (Political) value implies impact on personal or corporate influence on government actions or policy, on role in political affairs, or influence on political parties or prospects for current or future public office, including impacts on political advantage or opportunities, goals, resources for innovation or planning.

In each of these categories, Key Performance Areas (KPA) are defined to refine the value assessment and finally every KPA can be measured or assessed by one or more concrete key performance indicators (KPIs).

2.3.1 Key Performance Areas

Key performance areas, referred to as KPAs, are areas for project success factors that embed an improved performance of an organization. They are initiated by specific goals or demand that an e-government initiative aims to satisfy. A KPA can be assessed via one or more concrete KPIs, which are all related to this specific area. This hierarchy enables a transparent and aggregated view of a large number of KPIs, especially for big organizations with complex structures and heterogeneous business. For strategic organization's planning, the first step is to define a set of goals and related success factors on KPA level. Goals and factors can be then further refined by using different KPIs.

2.3.2 Key Performance Indicators

Key performance indicators (KPIs) are quantitative or qualitative measurements, which reflect the project success factors and address the performance of an organization. Often more than one KPI is related to the same success factor. In that way different areas of interest can be evaluated and explored whether a specific organization's goal is achieved. KPIs are either long term considerations, or refer to a specific period, during which their values will be collected, measured or assessed. The definition of what they are and how they are measured or assessed, however, does not change often. Each KPI must be correctly defined by a specific target e. g. gained profit (best as a fixed value), the period of validation (e.g. month or year), considerations (e.g. by units), the unit of measurement and a description how to assess/measure it respectively how and where the data can be collected.

This framework produces a 'Value Cube' as shown here below.

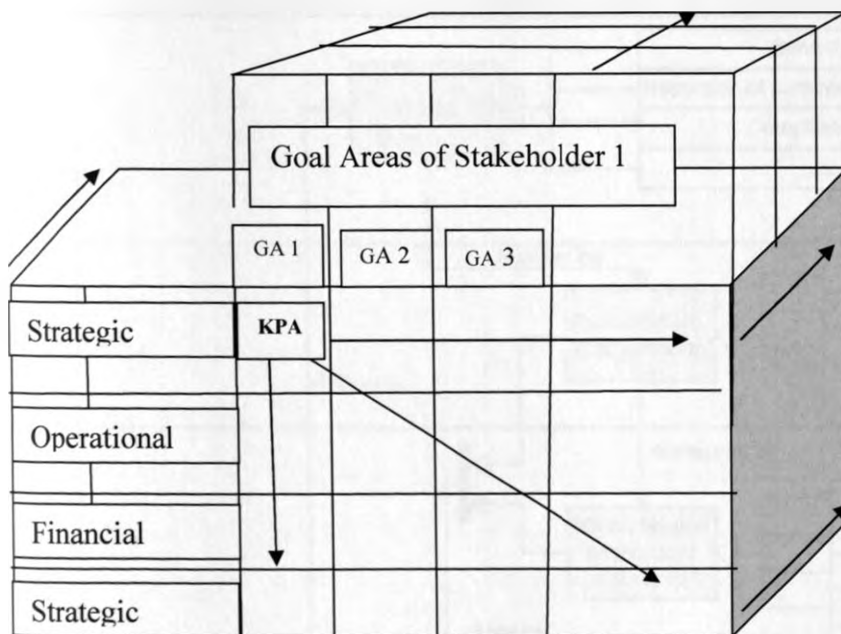


Figure 2.1 The Value Cube of integrated assessment framework

Source: Jianwei Liu et al (2008)

The value cube is structured as follows. First, it shows the goals of the analyzed project (columns) and puts them in relation to the value categories (rows), giving an overview of the Key Performance Areas (per combination of row and column, see Figure 2.1). Once the matrix has been elicited, Key Performance Indicators for the KPAs that are initiated in the matrix are defined. The value matrix is stakeholder-specific. As the KPAs and KPIs of various actors may be inter-related, to emphasize the network perspective on value

assessment, vertical players of the matrix are plugged in according to the number of stakeholders involved.

2.3.3 A step by step Evaluation Method Approach

The “value cube” is a light-weight approach to summarize the different concepts that are essential to explore stakeholder value. However, it does not give any suggestions on how to assess the value impacts that are embedded in the execution of e-government projects. In addition, it does not assist in measuring different cross cutting impacts on stakeholder value, caused by common interests among different stakeholders. To do so, a step by- step approach is introduced to achieve this goal as seen in figure 2.2.

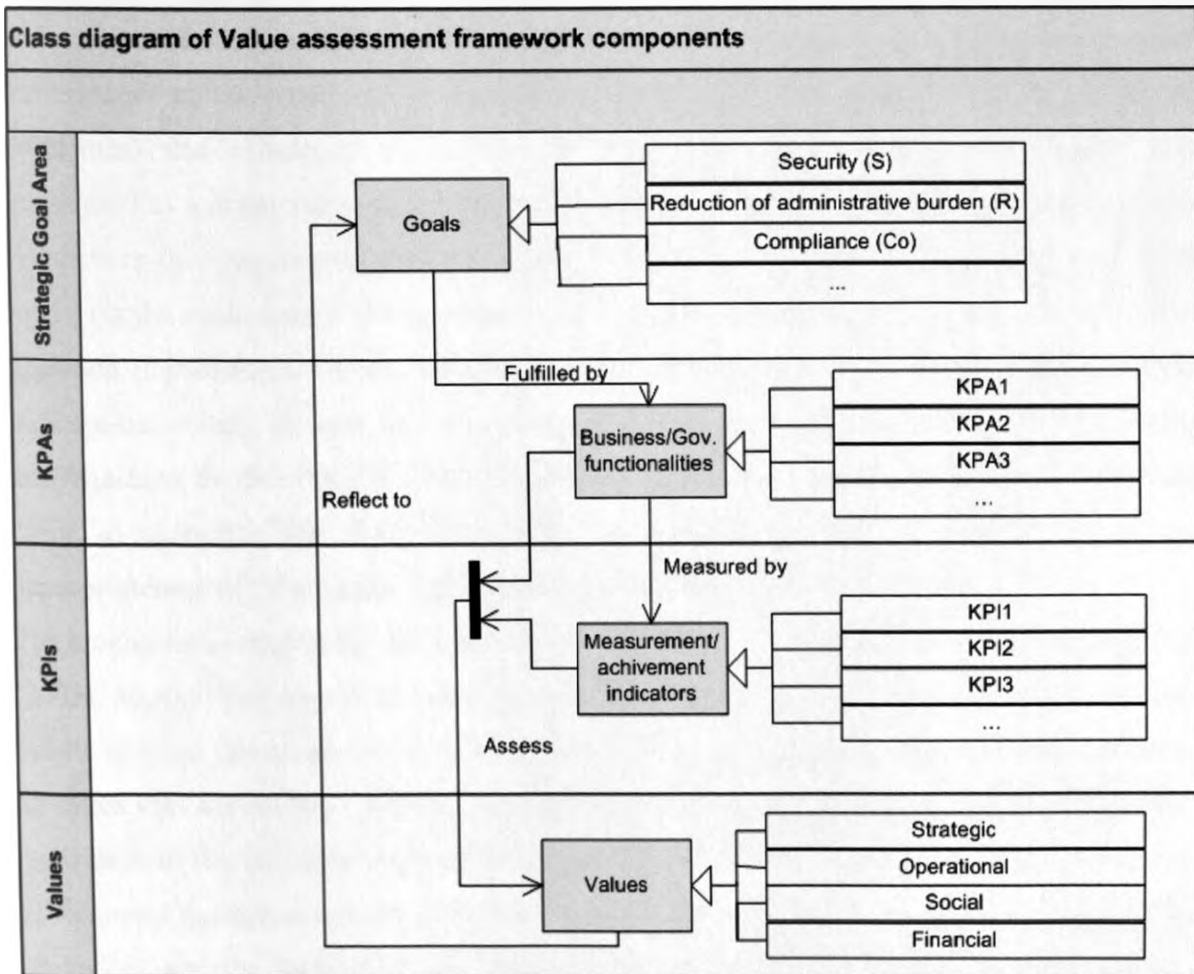


Figure 2.2 Model based method for deploying the value assessment

Source: Jianwei Liu et al (2008)

This framework considers four major factors:- Financial, Social, Operational and Strategic (political). These parameters are measured using predefined KPAs and KPIs with the

stakeholder's interest in mind. Our study focuses on the consumers of e-government services and specifically the citizens. Therefore in the context of our research the stakeholder to consider is the citizen whose goal is to be served effectively and efficiently by the government through the e-government systems.

2.4 E-Government Projects Evaluation Criteria by Alshawi and Alalwany

This framework is similar to the one proposed by Lie et al. Alshawi et al classifies the evaluation criteria into three groups: the technical issues group, the economical issues group, and the social issues group.

2.4.1 Technical Issues

Performance and accessibility were chosen for the first group of evaluation criteria. Performance measurement can be defined as "measurement on a regular basis of the results (outcomes) and efficiency of services or programs" (Hatry, 1999). Performance was considered as a major issue in influencing the citizen's perspective and is employed by many researchers in e-government services assessment. Wang et al. (2005) based their evaluation model on the evaluation of the performance of an e-government system with a citizen-centric approach. Performance in the Wang et al. model is measured by assessing the transaction between the citizen, the task the citizen is attempting to complete, and the government's Web site regarding the information task. The performance in this case can be judged by the time spent to complete the information task, the quality of the information found, the appropriateness of information found, and the satisfaction with the outcome.

The second issue chosen for this group was accessibility. According to Terry Ma and Zaphiris (2003), accessibility means an effective and efficient user interface that is inclusive of more people in more situations and can achieve user satisfaction. Poskitt (2002) has a similar view; he states that accessibility requires considering the needs of all citizens equally. Otherwise, realization of the idealistic vision of all citizens being able to interact freely with a responsive government through a multitude of technological channels runs the risk of increasing social exclusion, and the technologically literate will increase their advantage by monopolizing direct access to government.

2.4.2 Economic Issues

The second group of evaluation criteria contains the economic issues. The economic issues have traditionally dominated IS evaluation processes, and they are criticized as mentioned earlier by many authors for their limited relevance to the role of IS. Despite the limitations of using the economic issues in the evaluation, it is important to have them as part of the evaluation criteria. Direct costs and benefits, whether for government or citizens, are the basis for most evaluation calculations for many governments and private organisations.

2.4.3 Social Issues

Openness, trust, perceived ease of use, and perceived usefulness were chosen for the third group of evaluation criteria. Openness can be defined in terms of the amount of information that government organizations provide to citizens and the value of the information as a tool for citizens to see what government organizations are doing, understand why they are doing it, and potentially participate in the policy deliberation process (Eschenfelder & Miller, 2005). The second issue in the social evaluation criteria is trust. Belanger, Hiller, and Smith (2002) define trustworthiness as “the perception of confidence in the electronic marketer’s reliability and integrity.” Trust in the e-government context is associated with security and privacy. Citizens’ trust requires maintaining security in handling of information, protecting the privacy of citizens, and assuring them that their personal information will be treated confidentially. Without this assurance, it will be difficult to promote the use of e-government services (Pascual, 2003). Enhancing trust involves enhancing security and privacy measures, which requires a large variety of measures and principles, such as collection and use limitation, purpose specification, security safeguards, accountability, and encouraging the use of privacy-enhancing technologies and quality certificates (Aichholzer, 2003). The third issue in the social evaluation criteria is perceived ease of use and perceived usefulness. Davis (1989) defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance.” He also defines perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort.” In the proposed evaluation criteria, both ease of use and perceived usefulness are considered as one issue, because perceived ease of use contributes to perceived usefulness, because the easier a system is to use, the more useful it can be.

2.4.4 The criteria descriptions

The proposed evaluation criteria were classified into three groups: the technical issues group, the economic issues group, and the social issues group. Each of these groups contains one or more evaluation issues. Based on these, a new set of measuring factors and their descriptions are proposed to facilitate the measurement process of these issues as shown in table 2.1.

Summary of the Constructs of the Proposed Evaluation Criteria by Alshawi and Alalwany

Groups	Evaluation Issue	Measuring Factors	Measuring Factors Descriptions
Technical Issues	Performance	Efficiency of services	P1: Measured by the time spent to complete the task, and satisfaction with the outcome
		Personalised information and services	P2: Measured by the degree to which the system can enable citizens to personalize information and services according to their needs
	Accessibility	Efficient user interface	A1: Judged by the available options of user interfaces (e.g., graphic interface, multiscreen interface, attentive user interface)
		Disability access and language translation	A2: Is the system offering some form of disability access and foreign language translation features?
Economic issues	Cost saving	Money saving	C1: How much money the citizens are saving by using e-government services
		Time saving	C2: How much time the citizens are saving by using e-government services
Social issues	Openness	Openness	O: Measured by the value of information in terms of amount, quality and transparency that government organizations provide to the citizens
	Trust	Trust in the internet	T1: Measured by the degree of confidence of the citizens in the Internet
		Trust in the government organisations	T2: Judged by the level of security in handling of information and protecting the privacy of citizens
	Perceived ease of use and perceived usefulness	Perceived ease of use	U1: Judged by the level of complexity of using an e-government service
Perceived usefulness		U2: Measured by the comprehensiveness and the features of the e-government system	

Table 2.1 Constructs of the evaluation factors by Alshawi and Alalwany

Source: Sarmad Alshawi et al (2007)

This framework share several similar evaluation parameters with the integrated assessment framework developed by Lie et al. These parameters are social, financial/economic and operational/technical.

Alshawi et al framework focuses his study on the consumers of the e-government systems, who are in their case the citizens. This framework can be adapted to the Kenyan situation with slight modifications of the parameters to fit the e-government phase where Kenya belongs.

2.5 Content, Context and Process (CCP) Framework

This framework reflects the social, political and cultural factors that influence the economic benefits and emphasises the need for an integrated approach to evaluation.

The calls for interpretive approaches to IS evaluation that incorporate the recognition of information systems as both social and technical entities have increased since the late 1980s (Hirschheim and Smithson, 1988; Symons, 1991; Walsham, 1993). Hirschheim and Smithson (1988) argue that treating IS evaluation as a technical problem leads to meaningless conclusions that overlook the social activity inherent in the evaluation process and ignores the political–social environment of an organisation.

The CCP was introduced by Pettigrew (1985). Symons (1991a) reviewed IS literature using the framework and proposed it for IS evaluation in context. The modified CCP comprise of the three main elements:-

- Content - “what” is being evaluated
- Context - “why” and “who” evaluate Information System implementation
- Process - “how” and “when” evaluation is being done

This is presented in figure 2.3 below.

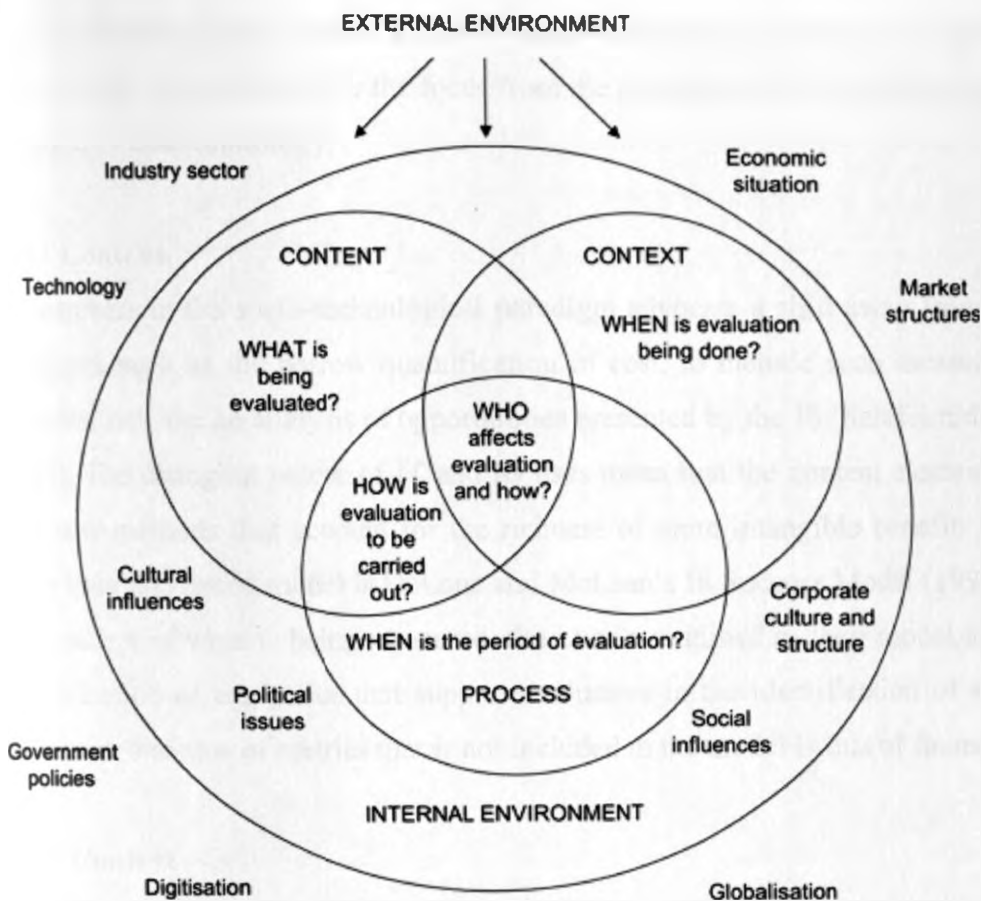


Figure 2.3 CCP framework (Stockdale and Standing 2006)

Source: Wojciech and Irani (2008)

The selection of the CCP perspective has two advantages. First, there is a widespread acceptance of CCP among leading contributions to IS evaluation theory (Lyytinen et al., 1991; Serafeimidis and Smithson, 1998; Smithson and Hirschheim, 1998; Walsham, 1993, 1999) that has led to recognition of the concepts in much of the recent literature. Second, the concepts are broad enough to accommodate the myriad ideas and arguments in this well documented field, while still providing parameters for reviewing them.

Stockdale R. & Standing C. (2005) argue that the use of CCP as an overarching approach to evaluation allows for questions of what is being measured, by whom and for what purpose, to be asked. The interaction and linking between context, content and process allows for the complicated procedure of evaluation to be explored in multiple ways. For example, an exclusive focus on what is to be evaluated ignores the reasons for the evaluation and the stakeholders that impact on the information systems. The context of the organisation, including its history, its relationships and its information flows supports the treating of evaluation as a longitudinal process through the lifecycle of a system. This flexibility

encourages deeper questions in regard to socio-technical-political aspects of evaluation to be asked. Such questions address the focus from the perspective of the technology and the people engaged in that technology.

2.5.1 Content

Researchers in the socio-technological paradigm advocate a shift away from straightforward measures such as the narrow quantification of cost, to include such measures as intangible benefits, risk and an analysis of opportunities presented by the IS (Serafeimidis and Smithson, 2000). The changing nature of IT and its uses mean that the content elements have changed and new methods that account for the richness of more intangible benefits are needed. The most tried and tested model is DeLone and McLean's IS Success Model (1992; 2003). Within the concept of what is being measured, the metrics outlined in their model allow for detailed identification of categories that support evaluators in the identification of success in an IS. However, one area of metrics that is not included in the model is that of financial measures.

2.5.2 Context

Context includes all factors which influence evaluation (Serafeimidis, *et al.* 1999, Serafeimidis, *et al.* 2000). Internal and external contexts determine "why" and "who" evaluate IS implementation, its time and purpose (Huerta, *et al.* 1999, Stockdale, *et al.* 2006a). Originally Pettigrew (1985) used several levels of context for the analysis. At the first level, it was a group level. Analysis of the group level was placed in the inner and immediate contexts. The next level of analysis is an outer context. However, in the IS evaluation literature, the context is separated into two levels only. The first context level is located within an organisation, and is named as: internal, inner, or internal environment.

The second level of context includes issues that are outside the organisation, and is named as: outer, external, or external environment.

The original CCP framework that was composed of internal and external context, Wojciech Piotrowicz and Zahir Irani (2008) added the system context, that can be used in case of evaluation of more complex organisations – such as corporations, or supply chains, where system context is the nearest surrounding of the analysed organisation – the organisation is linked closely with the system, and can influence it directly or indirectly, but does not have full control of it. Wojciech Piotrowicz and Zahir Irani (2008) added the IT/IS context, that includes all IT/IS related aspects, such as IT usage, standards, technologies and IT staff experience.

The organisational context will determine the reason for an evaluation and affect the influences of the stakeholders and requires the why and who of evaluation to be considered within the context section. Trends and developments in the wider business environment also need to be considered since they are powerful legitimating forces. The purpose of an evaluation tends to be for appraisal of value, a measure of success or recognition of benefits (Guba and Lincoln, 1989; House, 1980).

2.5.3 Process

Guidance on the process of evaluation requires information to explain the how of evaluation (Symons, 1991). There are a wide range of different methodologies and instruments reported in the literature to examine the how of evaluation; such as simulation modelling (Giaglis et al., 1999), cost benefit analysis, return on investment (Ballantine and Stray, 1999) and the traditional measure of user satisfaction that has been developed over many years. Symons (1991) describes the informal procedures and information flows around an IS as integral to the work done using the system and argues that evaluation should consider the diversity of official and unofficial information flows. Other 'how' factors to be considered include the involvement and commitment of stakeholders and the conducting of both formative and summative evaluations. Remenyi and Sherwood-Smith (1999) assert that continuous formative evaluation helps to minimise cases of failure, whereas summative evaluation is aimed at assessing outcomes and impacts and is by nature more financial/statistical. This view is supported by Farbey et al. (1999) who see accounting and control as essentially a summative evaluation process.

This framework discusses e-government software/ Information Systems evaluation in light of the environment that these systems operate. E-government software project is a sub-area of Information Systems, therefore it is imperative to evaluate an e-government system bearing in mind the content, context and process.

CCP framework concurs with the two earlier considered frameworks in that, e-government systems are not only technical objects but are objects that have social-political issues. Therefore in evaluation these issues should be accommodated.

2.6 E-government Balanced Scorecard

After analyzing popular and most used e-government software evaluation frameworks, P. Fitsilis, L. Anthopoulos and V. C. Gerogiannis suggested a holistic assessment framework. The 'ideal' holistic framework according to them should combine five different and concrete perspectives namely:

1. Project organization perspective
2. Project processes perspective
3. Project results perspective
4. Social and economic perspective
5. Citizen satisfaction perspective

The developers of this evaluation model borrowed from Kaplan and Norton (Kaplan & Norton, 1999) balanced scorecard that contains the following perspectives:

- The Learning & Growth Perspective: includes employee training and corporate cultural attitudes related to both individual and corporate self-improvement.
- The Business Process Perspective: refers to internal business processes. Metrics based on this perspective allow the managers to know how well their business is running, and whether its products and services conform to customer requirements (the mission).
- The Customer Perspective: contains indices that measure customer satisfaction, via analyzing customers in groups, and via assigning business processes to products and services delivered to these groups.
- The Financial Perspective: refers to financial indices, which evaluate funding and cost benefit results.

Armed with the above they developed a balanced scorecard taking into consideration the following perspectives that focus on project management issues:

- Project organization perspective examines the organizational and operational environment, where the project will be implemented and the deliverables to be expected. Organization perspective matches organization's readiness (infrastructure, experience, maturity and willingness etc.) concerning project management and ICT. Moreover, the organization's perspective considers a lot of managerial aspects for the project (time and cost attributes etc.).
- Furthermore, this perspective measures aspects regarding the e-government readiness and the prosperous external environment perspectives, while it considers the learning and growth perspective from the balanced scoreboard.

- Project processes perspective evaluates project processes concerning their alignment and their agility (interoperability) with other existing or ongoing e-government projects. Additionally, this perspective measures attributes concerning the conformation to existing strategic planning and to the online availability perspective, while it is inspired from the business process perspective from the balanced scoreboard.
- Project results perspective reflects deliverables' size, quality, complexity and their requirements concerning infrastructure resources and capacity.
- Social and economics perspective considers the project's implications to its environment. This dimension evaluates how the project affects social life and employment; it examines project's conformation to policies and strategy; and it evaluates how much the project supports the 'close' of the digital divide. The main difference is that Social and economics indices are macro indices, since they evaluate the progress of the society and economy in general (e.g. the contribution to quality of life, the contribution to democracy etc.), while citizen satisfaction indices focus on satisfaction achieved from using specific ICT services. Moreover, this perspective investigates alignment to e-government literature (like openness and digital divide).
- Citizen satisfaction perspective deals with the satisfaction of e-government stakeholders (citizens, enterprises, civil servants etc.).

The e-government balanced scorecard framework looks at all the perspectives in evaluation and as the name suggests it balances all these perspectives to produce an overall evaluation criteria in e-government project evaluation. This framework concurs with all other frameworks considered in this study in that it combines social, economic and technical aspects in the design of the balanced scorecard. However it proceeds ahead and incorporates aspects of project organisation and project processes which are omitted by other scholars we have considered.

2.7 Delone and Mclean IS Success Model

In 1992 Delone and Mclean made significant breakthrough when they undertook a comprehensive review of Information Systems and their success. They proposed a model that could be used to evaluate multi-dimensional aspects that are integrated an IS systems. The measurement of information systems (IS) success or effectiveness is critical to understanding

of the value and efficacy of IS management actions and IS investments. This model identified six interrelated dimensions of Information System (IS) success. It proposed that the dimension of IS success can be represented by the system quality, the output information quality, consumption (use) of the output, the user's response (user satisfaction), the effect of the IS on the behaviour of the user (individual impact), and the effect of the IS on organizational performance (organizational impact). This model provided a system for classifying the multitude of IS success measures and suggested the temporal and causal interdependencies between the six dimensions (Petter and McLean, 2009).

The model is shown below:-

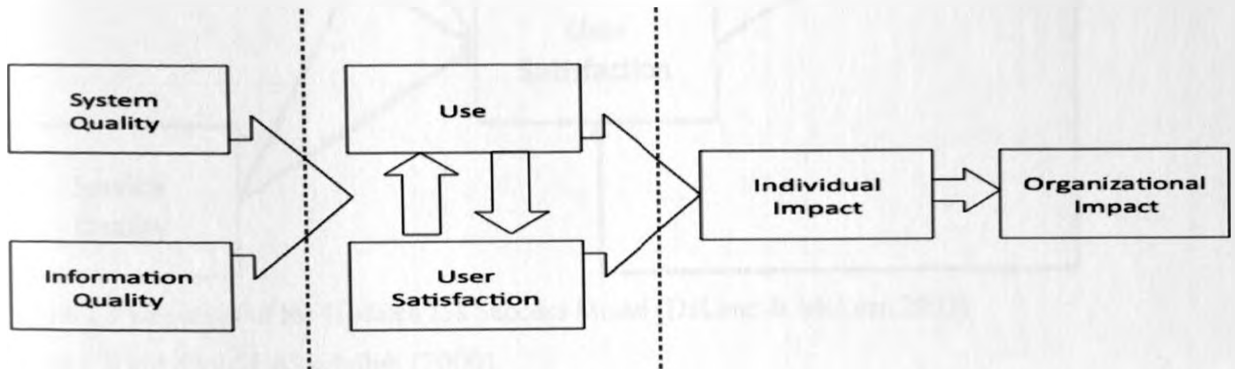


Figure 2.4 Information Systems Success Model (DeLone & McLean 1992)

Source: Raid Moh'd Al-adaileh (2009)

McLean and DeLone have since then updated their successful IS Success Model and added another dependent variable known as service quality. The interdependences and interrelationship are portrayed by use of arrows. Below is the updated IS model.

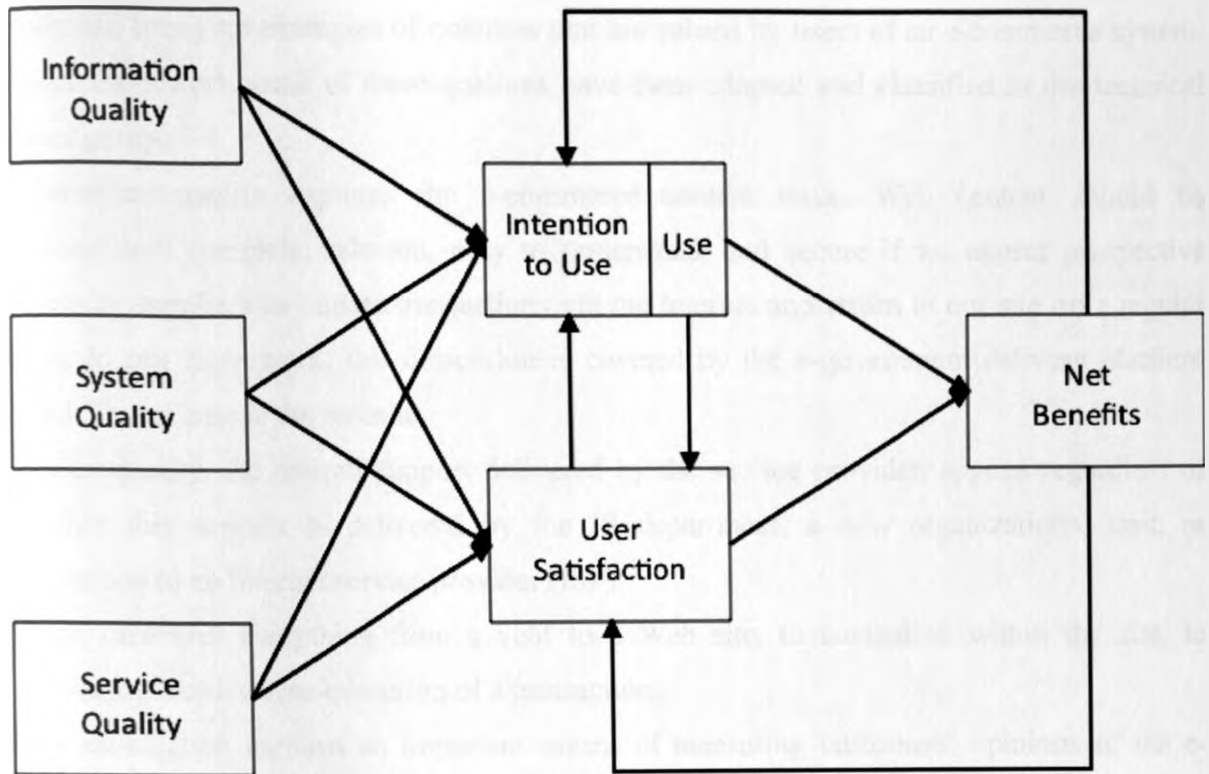


Figure 2.5 Depiction of the Updated ISs Success Model (DeLone & McLean 2003)

Source: Raid Moh'd Al-adaileh (2009)

Information Technology in general, and the Internet in particular, is having a dramatic impact on business operations. As said earlier governments and companies are making large investments in e-commerce applications but are hard-pressed to evaluate the success of their e-commerce systems. IS researchers have turned their attention to developing, testing, and applying e-commerce success measures. The updated ISs Success Model can be adapted to evaluate an e-commerce application. E-government applications are essentially e-commerce applications as they both share a lot in common. Within the e-commerce and e-government context, the primary system users are customers or suppliers rather than internal users. Customers and suppliers use the system to make buying or selling decisions and execute business transactions. These electronic decisions and transactions will then impact individual users, organizations, industries, and even national economies. This communications and commerce process fits nicely into the updated DeLone & McLean IS Success Model and its six success dimensions.

System quality, in the Internet environment, measures the desired characteristics of an e-commerce system. Usability, availability, reliability, adaptability, and response time (e.g.,

download time) are examples of qualities that are valued by users of an e-commerce system. In our framework some of these qualities have been adopted and classified in the technical issues group.

Information quality captures the e-commerce content issue. Web content should be personalized, complete, relevant, easy to understand, and secure if we expect prospective buyers or suppliers to initiate transactions via the Internet and return to our site on a regular basis. In our framework, this dimension is covered by the e-government delivery platform which, in our case is the website.

Service quality, the overall support delivered by the service provider, applies regardless of whether this support is delivered by the IS department, a new organizational unit, or outsourced to an Internet service provider (ISP).

Usage measures everything from a visit to a Web site, to navigation within the site, to information retrieval, to execution of a transaction.

User satisfaction remains an important means of measuring customers' opinions of the e-commerce system and should cover the entire customer experience cycle from information retrieval through purchase, payment, receipt, and service.

Net benefits are the most important success measures as they capture the balance of positive and negative impacts of the e-commerce on customers, suppliers, employees, organizations, markets, industries, economies, and even societies.

2.8 Technology Acceptance Model (TAM)

Based on the theory of reasoned action (Davis 1986) developed the Technology Acceptance Model (TAM) represents an important theoretical contribution toward understanding IS usage and IS acceptance behaviours and explains how users come to accept and use ICT. Studying the acceptance and use of ICT has been the focus of many studies in IS research and among a variety of theoretical perspectives to explain the adoption and usage of IS, the technology acceptance model (TAM) is popularly used to explain the user's intention to adopt a target information system (Davis and Wiedenbeck 2001). The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably the perceived usefulness and perceived ease of use (Kim et al., 2009)

Perceived usefulness (PU) is defined as the degree to which a person believes that using a particular Information System could enhance his or her job performance. It is the extent to

which an individual believes that using the ICT enhances his/her performance (Davis, 1989). Perceived ease of use (PEU) refers to the degree to which a person believes that using a particular system is free of effort. Previous research has shown that individuals are more likely to use a new ICT if they perceive that it is easy to use (Davis, 1989).

The model is shown below.

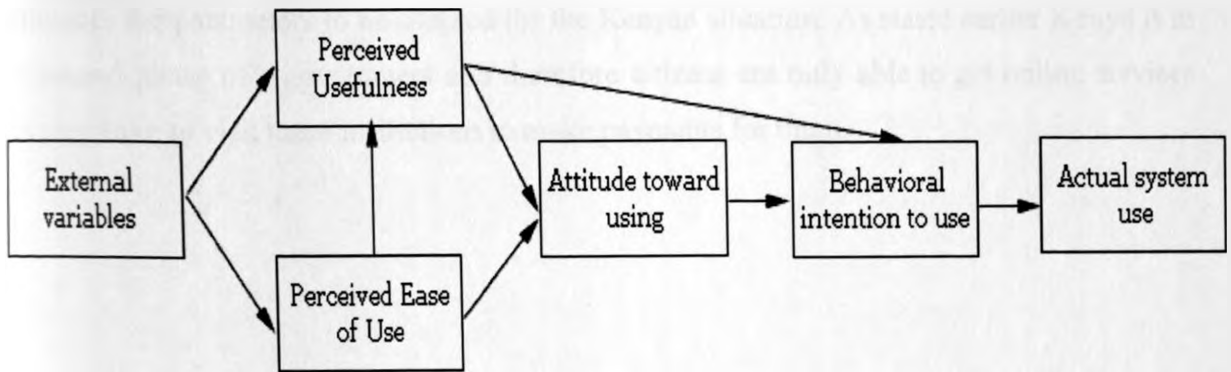


Figure 2.6 Technology Acceptance Model (Model Davis, 1986)

Source: Hamner and Qazi, (2009)

The technology acceptance model has been considered as the most comprehensive attempt to articulate the core psychological aspect associated with technology use based on the generic model of attitude and behaviour. The model Technology Acceptance Model has been widely adopted and there have been previous researchers who have used this model to evaluate different aspects of successive implementation and adoption of ICT hence making the model very important in the field of ICT (Liaw, 2007) and (Davis and Wiedenbeck 2001).

Delone and Mclean IS Success and Technology Acceptance Models are widely accepted to measure success of an IS and ICT adoption respectively. These two models give parameters that can be used to evaluate e-government systems. They comprehensively cover technological/technical and social issues of in e-government systems evaluation. These models focus on the intended user of the system and the quality of the system.

2.9 Summary of E-government Evaluation Frameworks

From the above mentioned frameworks, it is evident that any e-government software evaluation must contain at least three aspects; technical, financial and social aspects. All of the frameworks reviewed contained all or at least one of these aspects.

It is also evident that e-government systems are designed to benefit many stakeholders and each stakeholder has different goals that they expect to be met in these systems. Our main stakeholder in this study is the citizen who is the intended beneficiary of e-government systems.

Lastly, the environment in which the e-government system operates is an important factor that influences the parameters to be adopted for the Kenyan situation. As stated earlier Kenya is in the second phase of e-government and therefore citizens are only able to get online services but they have to visit these institutions to make payments for them.

2.10 The Proposed Framework

As the previous chapter on literature review shows, there are many frameworks on IS/e-government software evaluation which has been developed each handling this subject from a different perspective.

The proposed framework borrows the most appropriate parameters from the considered frameworks which are relevant to the Kenyan situation. Kenya is in its formative stages of e-government implementation and therefore it is paramount to ensure that e-government systems are successful. One of the ways to ensure successful implementation of e-government projects is by carrying out post implementation evaluation in order to find out the challenges that e-government projects are facing and design ways of improvement.

The proposed framework contains four aspects.

1. Technical issues
2. Economic/Financial issues
3. Social/soft issues
4. Delivery platform (Website)

In Kenya the sponsors of e-government systems is the government with the sole aim of providing efficient and effective to its citizens.

2.10.1 Technical Issues

E-government software projects are both social and technical entities (Stockdale, R & C. Standing, 2006). Technical or quantifiable economic elements that has been a focus of the majority of IS evaluation to date (Symons 1991). Bass (1998) and Clements (2002) propose the following qualities of an Information System:

- Usability – user’s ability to utilise a system effectively;
- Performance – responsiveness of the system – the time required to respond to stimuli or the number of events processed in some interval of time;
- Reliability – ability of the system to keep operating over time;
- Availability – proportion of time the system is up and running;
- Security – system’s ability to resist unauthorised attempts at usage and denial of service while still providing its services to legitimate users;
- Functionality – ability of the systems to do work for which it was intended;
- Modifiability – ability to make changes to a system quickly and cost effectively;
- Portability – ability of the system to run under different computing environments;

- Variability – how well the architecture can be expanded or modified to produce new architectures that differ in specific, pre-planned ways;
- Subsetability – ability to support the production of a subset of the system; Testability – ability to observe results and control the components internal state in order to identify system faults;
- Conceptual Integrity – vision that unifies the design of the system at all levels (ability of the architecture do similar things in similar ways);
- Building simplicity – ability to implement the defined architecture;
- Cost – System Cost;
- Time to market – Time required to implement the architecture.

Some of these quality attributes might be observable during execution i.e. usability, performance, reliability, availability, security and functionality while others are non-observable during executing i.e. Modifiability, portability, variability, subsetability and testability.

McLean and DeLone (2003) propose similar e-commerce system qualities. These qualities are; usability, availability, reliability, adaptability and response time (e.g., download time) that are valued by users of an e-government system. In our proposed framework these qualities fall under technical aspect. We focus on three qualities in our proposed evaluation framework for practicability, these are: Usability, Performance and Availability.

2.10.2 Economic/Financial Issues

Assessment of E-government software system/IS can be done via many perspectives, however all these perspectives give to a certain degree of subjective results. Economic evaluation metrics are universally agreed and give hard objective facts. This enables project sponsors to make a decision based on the results, for example, a return of investment or present net value will indicate to the management if a project is worth undertaking or not. However this aspect of e-government evaluation is not a driving force in government funded projects. The major driving force in government funding an e-government project is to ensure its clients/citizens are offered efficient and effective service. However governments are going through thorough scrutiny on the use of public resources and hence they want to account for these resources. To achieve this, the government must carry out economic/financial evaluation on its investment in IT. If the citizens are able to efficiently and effectively receive e-government services, then there would be enough justification for ICT investment by government.

In our proposed framework we look at this aspect from the client/citizen perspective. We look at the savings accrued both in time and money as a result of clients/citizens making use of online services provided by the e-government software projects. If clients are satisfied with the services provided by these projects then it would be implied that governments are justified in investing in these projects. The parameters chosen in our framework are time saving and money saving.

2.10.3 Social Issues

As literature shows an e-government software project is not only a technical issue but has a social aspect. In evaluating an e-government system, it is therefore imperative to ensure social issues are assessed to ensure a complete impact of the project to the society is known. Benefits such as improved decision making, customer or citizen satisfaction, and employee productivity contribute significantly to higher performance (Gupta et al 2003).

Some parameters used in DeLone and Mclean IS Success (1992 &2003) and Technology Acceptance Models (Davies 1986) are adopted in our framework. These parameters are:-

1. Trust
2. Perceived convenience
3. Openness

Parameters definitions

Trust

Belanger, Hiller and Smith (2002) define trustworthiness as ‘the perception of confidence in the electronic marketer’s reliability and integrity’. Trust in the e-government context is associated with security in handling of information, protecting the privacy of citizens, and assuring them that their personal information will be treated confidentially.

Convenience

Convenience is defined as something; an appliance, a device or service conducive to comfort or ease, fitness or suitability for performing an action or fulfilling a requirement. The notion of convenience perception receives much attention in the field of Information Systems (Jih, 2007). E-government services are meant to offer government services to an increased choice of citizens.

Openness

Openness can be defined in terms of the amount of information that government organizations provide to citizens and the value of the information as a tool for citizens to see what government organizations are doing, understand why they are doing it, and potentially participate in the policy deliberation process (Eschenfelder & Miller, 2005).

2.10.4 Delivery Platform

The objective of E-government Systems is to provide online services to a wide range of citizens anywhere and anytime. These can be done via several platforms including the World Wide Web (internet) and cell phones. Most literature on e-government systems online services evaluation focus on these services offered via the internet. This is because most applications are not developed to run on hand held devices like mobile phones although these types of applications are gaining popularity and with a high rate of mobile penetration in the developing world, most online services will be offered through them.

In this research we focus on evaluation of e-government systems offering online services via the internet. To ensure a wholesome evaluation of these online services is carried out, then the platform on which these online services are offered need to be evaluated too. In this regard, a number of factors were identified and proposed for evaluation of the websites. Web Content Accessibility Guidelines (WCAG 2.0) provide the basic requirements for designing accessible web content. The four principles are; Content must be perceivable, Interface elements in the content must be operable, Content and controls must be understandable, Content must be robust enough to work with the current and future technologies. From these principles the following elements were selected for website evaluations.

Navigation - Web site navigation is the science and skill which you apply to a web site that helps visitors move from one page to another.

Organisation – How the website web pages are presented in the website.

Accuracy – A scenario where the website gives correct information

Up-to-date – Website containing valid and current information

Clarity – Ability of the website to communicate information without ambiguity

Presentation – How well or bad a website displays the information it carries

Useful help menu – The ability of the website to provide help on the content or organisation it represents.

Conceptual Framework

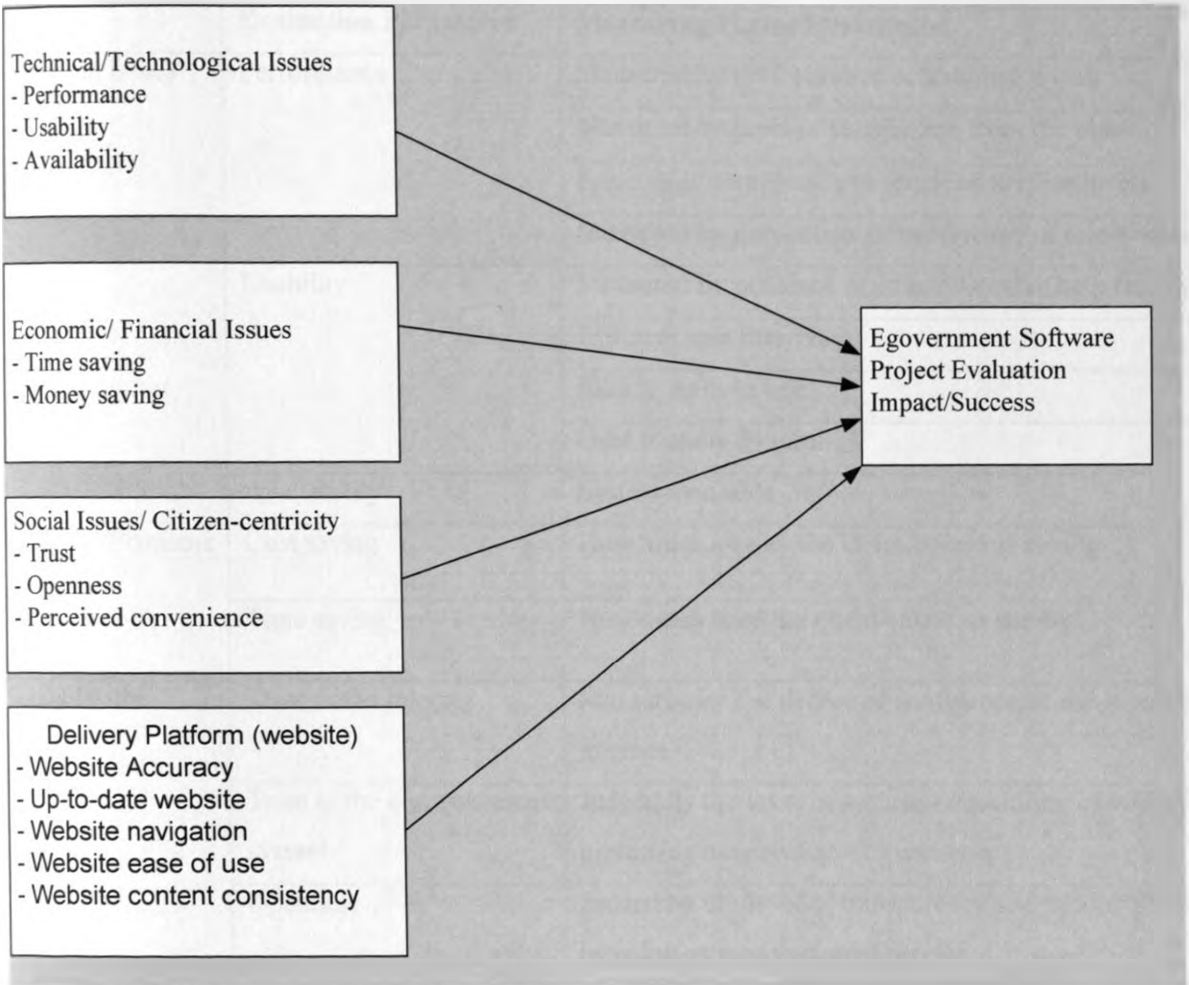


Figure 2.7 Conceptual framework for e-government systems evaluation

Summary of the constructs of the proposed Evaluation Criteria

Group	Evaluation Parameter	Measuring Factor Description
Technical Issues	Performance	Measured by time taken to accomplish a task
		Measured by level of satisfaction from the client
		Percentage compliance to specified service levels
		Measured by percentage of occurrence of errors while in use
	Usability	Measured by presence of comprehensive help facility
		Efficient user interface
		Ease to learn to use
Availability	System available 24/7	
Financial/Economic Issues	Cost saving	How much money the client/citizen is saving
	Time saving	How much time the client/citizen is saving
Social Issues	Trust in the internet	Measured by the degree of confidence of the clients in the internet
	Trust in the e-government system	Judged by the level of security in handling of information and protecting the privacy of the clients
	Openness	Judged by the level of transparency and accountability enjoyed by using an e-government service
	Perceived convenience	Measured by the convenience that the e-government service offers
Delivery Platform (Website)	Easy to use and Navigate	Ability to navigate from one position of the website to another with ease
	Presentation of website content	How well the web content is consistently offered by the website
	Website organisation is logical and clear	Measured by clarity of the website and uniformity of the website organisation
	Accuracy	Measured by the level of accuracy of website content
	Up-to-date	Measured by the validity and currency of the website content
	Clear and easy to understand content	Measured by the ease of understanding of the website content
	Helpful menu	Measured by the comprehensiveness of the help menu

Table 2.2 Summary of the constructs of the proposed Evaluation Criteria

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research design

The research methodology employed in our research is case study. This research design techniques was chosen because there are very few e-government systems that offer interactive online services. Kenya Public Service Commission Online Job Application and Selection Database System and Kenya Revenue Authority (KRA) New Taxpayer PIN Registration Systems were chosen.

3.2 Target population

In our study, the target population are all users of Kenya Public Service Commission Online Recruitment and Selection Database System (who happen to be the citizens applying for government jobs online for the first time and those civil servants applying for promotion in the civil service) and KRA new Taxpayer PIN registration users. In Kenya every taxpayer is expected to have a Personal Identification Number (PIN) in order to enable him/her file the required taxes either manually or electronically. PIN is also a requirement by the Kenyan government in most business transaction involving registration of properties.

3.3 Sampling frame and Sample Size

In our first case, the Public Service Commission Online Selection and Recruitment Database System, a list of all online job applicants in the year 2010 were obtained from the Public Service Commission. Using a statistical system (STATA) we randomly obtained online job applicants on the basis of Job Group. Job groups ranged from job group J to job group T. The reason behind using job group as a criteria for selecting online job applicants is that, the lower job groups are mostly filled by new recruits in to the civil service while the higher job groups are mostly filled by serving officers who apply for promotion in their respective areas of specialization. With this kind of sample we are able to get response from both new and old users of the system. This method yielded a total of 433 online job applicants. This was used as the N in our calculation to obtain the sample size n.

In order to get the required information with the least sampling error, the following statistical formula was used to determine the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size, and e is the level of precision (say 95 per cent confidence level ($\pm 5\%$ precision)).

The target population is N = 433

The sample size (n) comes to:

$$433 / (1 + 433 * .05^2)$$

$$= 204$$

Target Population	Sample Size
433	204

A list of all email addresses for these online job applicants were obtained from the commission to whom the researcher sent the questionnaire to.

In the case of KRA new Taxpayer PIN registration, the year 2010 online users of this service were obtained. Using a statistical system (Stata) we randomly obtained online new Taxpayer PIN registration applicants on the basis of age. The reason for using this criterion was that we wanted to get views of online users across all age brackets. This criterion yielded a sample size of 210.

3.4 Data Collection Methods

Self administered questionnaires were used for data collection. This method was chosen because we could reach to as many e-services users as possible regardless of their geographical location. We distributed the self administered questionnaires by sending them to the intended recipients via their email address. A sample of each of the two questionnaires is attached in the appendix 1 and 2. The recipients were expected to fill the questionnaires and resend them back to the researcher.

3.5 Reliability and validity

To measure the validity and validity of our questionnaires, we subjected the instrument to a number of respondents for one week. We then analyzed for content validity and relevance through peer-review.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

In this research we chose the KRA new Taxpayer PIN registration and the Kenya Public Commission Recruitment and Selection Database System as our case study. A total of 240 questionnaires were administered on the online job applicants. The first step was to examine all the questionnaires in order to eliminate the wrongly filled ones. The elimination process left us with 205 valid questionnaires which translated to 85.4%. In the KRA New Taxpayer PIN Registration a total of 250 questionnaires were administered, out of these 210 questionnaires were passed as the correctly filled ones which translated to 84%.

The purpose of collecting data was to carry out an evaluation of the identified e-government systems using the proposed metrics in our evaluation framework. As earlier indicated the evaluation of e-government software project was to be carried out with a focus on the citizens who are the consumers of these e-government services.

4.2 Data Processing and analysis

STATA, a statistical software was used to perform the test we carried out. The findings, analysis and interpretations from the data we collected from both the Kenya Public Service Online Job Application System and KRA New Taxpayer PIN Registration System users are presented in this chapter.

4.3 Coding the Data

The data collected was captured in Microsoft Excel and then imported to STATA. In STATA, the data was coded by assigning numbers for the Likert-type questions in order to enable us run all the tests needed. Below is an example of the coded data.

trust	Transparency	Engagement	Sys Complexity	Convenience	Privacy
d	c	b	c	b	c
d	b	b	c	b	d
d	d	d	d	b	c

Table 4.1 Coded data

4.4 Reliability and Validity of the collected data

As indicated in the earlier chapter on research methodology, it is advisable to ensure that the data collected by the research instruments used is both reliable and valid. We carried out the reliability test using the Cronbach Alpha and the results were as shown below for the Online Job Application System.

Item	Obs	Sign	Correlation	Item-rest correlation	Average interitem covariance	alpha
Cost Saving	205	-	0.3855	0.2057	0.1081488	0.807296
Time Saving	182	-	0.3486	0.191	0.1073092	0.798208
System Speed	205	-	0.4502	0.3196	0.1041312	0.7808
System Error	205	+	0.6729	0.5648	0.0856049	0.721536
Navigation	205	-	0.4924	0.343	0.0979137	0.767232
User Friendly	205	+	0.1912	0.0841	0.1154305	0.806912
Easy to learn	205	-	0.2939	0.1228	0.1102635	0.806656
System Help	205	+	0.335	0.1766	0.107188	0.795776
System Transparency	205	+	0.2024	0.1083	0.1174038	0.809856
Engagement	205	+	0.3138	0.2445	0.1139738	0.79744
System Complexity	205	-	0.1121	-0.0044	0.1225765	0.827648
Convenience	205	-	0.0448	-0.0202	0.1212543	0.816512
Privacy	201	-	0.1768	0.0555	0.117917	0.816
Content Presentation	205	+	0.3826	0.212	0.1082669	0.80192
Website Organisation	198	+	0.4921	0.3402	0.1001407	0.775424
Accuracy	204	+	0.5719	0.4318	0.094271	0.755968
Up-to-date	205	+	0.6119	0.4807	0.0911822	0.744832
Content Clarity	199	+	0.1078	0.0071	0.1197732	0.817536
Help Menu	205	-	0.2029	0.0737	0.11759	0.81664
Test scale					0.1084391	0.810624

Table 4.2 Results of Cronbach Alpha test on Online job application service

As shown in table 4.2 the alpha is 0.8106 which exceeds the acceptable 0.7 as outlined by George and Mallery (2003) who provided the following rules of thumb: Greater or equal to 0.9 is Excellent, Equal to 0.8 is Good, Equal to 0.7 is Acceptable, Equal to 0.6 is Questionable, Equal to 0.5 is Poor, and Less than 0.5 is Unacceptable

The following results were results of a Cronbach Alpha test for the KRA Taxpayer PIN Registration data.

Item	item-test			item-rest	average	alpha
	Obs	Sign	correlation	correlation	interitem	
Cost Saving	210	+	0.3748	0.3118	0.2544	0.8248
Time Saving	210	+	0.5161	0.4442	0.2424463	0.8189
System Speed	210	-	0.2930	0.1716	0.2544427	0.8345
System Error	210	-	0.3488	0.2211	0.2483789	0.8328
Navigation	210	+	0.7052	0.6345	0.2196777	0.8066
User Friendly	210	+	0.7856	0.7234	0.2077898	0.7994
Easy to learn	205	+	0.6955	0.602	0.2156552	0.81
System Help	210	+	0.5955	0.5106	0.2303548	0.8146
System Transparency	210	+	0.3721	0.3025	0.2531304	0.8248
Engagement	209	+	0.4294	0.3301	0.2445515	0.8246
System Complexity	210	-	0.4974	0.3966	0.2366118	0.8207
Convenience	210	+	0.6400	0.581	0.2347129	0.8128
Privacy	210	+	0.3549	0.2789	0.2535925	0.8259
Content Presentation	210	+	0.2276	0.1568	0.2613275	0.83
Website Organisation	205	+	0.4154	0.3456	0.2502203	0.8231
Accuracy	206	+	0.5668	0.5018	0.2397407	0.8165
Up-to-date	210	+	0.5043	0.435	0.2442322	0.8196
Content Clarity	210	+	0.5661	0.4956	0.2382754	0.8164
Help Menu	210	+	0.4725	0.3811	0.2422412	0.822
Test scale					0.2406179	0.8281

Table 4.3 Results of Cronbach Alpha test on Online Tax PIN service

As shown in table 4.3 the alpha is 0.8281 which exceeds the acceptable 0.7 as outlined by George and Mallery (2003).

Therefore, these test results demonstrate that the questionnaires used to in our evaluation of the e-government systems in both cases are valid. Consequently, the responses obtained from the respondents are valid.

4.5 Result 1: Public Service Commission Online recruitment and selection

Database System: Analysis of responses

In this section, we give a detailed analysis of the responses we obtained from the 205 valid responses.

4.5.1 Respondents by gender

Table 4.4 below indicates the respondents by gender. 59.51% of the respondents were males and 40.49% were females. This response was good as the data represented both males and females equally.

Gender	Freq.	Percent	Cum.
Male	122	59.51	59.51
Female	83	40.49	100
total	205	100	

Table 4.4 Responses by gender

4.5.2 Respondents by Age

E-government online users are distributed among different age groups. Our questionnaire captured the age group of the respective respondent. Table 4.52 shows the response rate based on age.

Age	Freq.	Percent	Cum.
20-30	97	47.32	47.32
31-40	74	36.10	83.42
41-50	31	15.12	98.54
51-60	3	1.46	100.00
Total	205	100.00	

Table 4.5 Responses by age

4.5.3 Respondents by Education Level

As a way to measure the level of satisfaction based on the education level, we had three levels of education; University graduates, Middle level college graduates and O level graduates. The respondents were expected to state their highest level of education. Table 4.6 shows the response by education level.

Education Level	Freq.	Percent	Cum.
College	96	46.83	46.83
Graduate	98	47.80	94.63
O level	11	5.37	100.00
Total	205	100.00	

Table 4.6 Responses by education level

4.5.4 Respondents by Computer Skills

Most of the respondents indicated that their computer skills are either good or fair. Few of the respondents indicated that they have excellent computer skills. Of interest to note is that none of the online job applicants indicated that they have very poor or poor level of computer skills as shown in table 4.7. This implies that they may be higher consumption of e-government services if computer skills of the intended users are high.

Comp Skills	Freq.	Percent	Cum.
Fair	94	45.85	45.85
Good	96	46.83	92.68
Excellent	15	7.32	100.00
Total	205	100.00	

Table 4.7 Responses by computer skills

4.5.5 Financial/Economic Issues

This section measured the economic factors that affect citizen's utilization of e-government online services. Two factors, that is, cost saving and time saving were used in this group. Table 4.8 below indicate that 51.71% of the respondents agreed that it is cost effective to apply for jobs online as compared to the manual job application. 30.73% strongly agreed on the same. This justifies the essence of the government investing in e-government systems as the citizens are able to get the services efficiently. However a sizeable 5.85% strongly disagree that it saves money to use e-government online services. This could be attributed to the speed of the internet or the online system itself. Availability of internet services could also be a factor in these results because one may be forced to travel to a place near the city to get this service. This shows that there is need to improve the speed at which these services are accessible.

54.4% and 31.87% agreed and strongly agreed respectively that it saves time to apply for a civil service job online compared to applying online. However 7.14% of the respondents disagree on the same meaning that the speed of the system or the speed of internet connectivity is a factor affecting utilization e-government services.

Financial Issues	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Total
Cost Saving	12 (5.85%)	4 (1.95%)	20 (9.76%)	106 (51.71%)	63 (30.73%)	205
Time Saving	0 (0%)	13 (7.14%)	12 (6.59%)	99 (54.40%)	58 (31.87%)	182

Table 4.8 Responses on the financial issues relating to the online job application service

4.5.6 Technical Issues

The first question rated the perception of online job applicants on the question of system speed. That is, if the respondents believed that it takes longer than necessary to complete the online application. This statistics show that many respondents strongly agree on this. This gives the government a challenge on improving the performance of the system and possibly internet connectivity speed. 68.78% of the respondents agreed that the system causes an error in the process of job application. This can be interpreted to mean that on the two technical issues dealing with the system quality, the public service online system performs poorly. However the system performs well on user friendliness, ease to use interface and easy to learn to use qualities. The system help facility may need to be improved because a sizeable 20.98% were indifferent on its helpfulness as shown in table 4.9.

Technical Issues	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Total
Takes longer time than necessary to complete a task	0 (0%)	28 (13.66%)	50 (24.39%)	35 (17.07%)	92 (44.88%)	205
Possibility of System error	3 (1.46%)	4 (1.95%)	14 (6.83%)	141 (68.78%)	43 (20.98%)	205
Easy to use interface	9 (4.39%)	7 (3.41%)	8 (3.90%)	144 (70.24%)	37 (18.05%)	205
User friendly	0 (0%)	25 (12.20%)	11 (5.37%)	8 (3.90%)	161 (78.54%)	205
Easy to learn to use	17 (8.29%)	22 (10.73%)	43 (20.98%)	109 (53.17%)	14 (6.83%)	205
Comprehensive help facility	0 (0%)	16 (7.80%)	43 (20.98%)	67 (32.68%)	79 (38.54%)	205

Table 4.9 Responses on the technical issues relating to the online job application service

4.5.7 Availability of the PSC System

E-government services are designed to be available to clients always. In our evaluation criteria one of the factors we used was on availability of the system for twenty four hours a day and seven days a week. Most respondents 59.02% indicated that the PSC system is only available sometimes seriously hindering the essence of an electronic service as shown in table 4.10.

Availability	Freq.	Percent	Cum.
Never Available	4	1.95	1.95
Available Sometimes	121	59.02	60.97
Available	79	38.54	99.51
Always Available	1	0.49	100.00
Total	205	100.00	

Table 4.10 Availability of PSC system

4.5.8 Efficiency of the service

The last question in the technical aspects group asked respondents to generally rate the efficiency of the online service. Majority of the respondents (54.68%) rated the online service as fair followed by 36.10% who rated the service as good as shown in table 4.11. This result indicates that there is room for improvement in all aspects of the system both the system itself and delivery of the online service.

Efficiency of the Service	Freq.	Percent	Cum.
Very Poor	3	1.46	1.46
Poor	14	6.83	8.29
Fair	108	52.68	60.97
Good	74	36.10	97.07
Very Good	6	2.93	100.00
Total	205	100.00	

Table 4.11 Responses on efficiency of the online job application service

4.5.9 Social Issues

The social issues group incorporated the following factors: Trust in the system, Transparency, Engagement, Privacy and Convenience. As shown in table 4.12, 53.17% of the respondents believed that the online job application process is more open than the manual process. This statistic shows that more than half of the citizens believe that the online system has introduced transparency in recruitment process and hence the uptake of this online system can only get high. However on the issue of engaging the job applicant in the process of recruiting, 34.63% of the respondents were indifferent indicating that there is a need by the e-government system implementers to involve the users more in the processes undertaken electronically. This engagement may be lead to higher utilization of the e-government online services. On complexity of the system, most respondents, 56.10%, were indifferent on the question that the system is unnecessarily complex. However 14.63% and 16.59% agreed and strongly agreed respectively on the unnecessary complexity of the system. This result would therefore mean that a process of making the system as easy as possible to learn and to use should be embarked on in order to probably enhance utilization of the online service. On the question of convenient, 48.78% respondents agreed and 51.22% strongly agreed that the system is convenient to use.

Most respondents, 57.21% were indifferent when asked if they believed that the data/information they gave via the system is confidentially held and 12.44% disagreed on the same. This statistics show that the e-government online service users are not confident about handling of their personal data by the e-government system and this therefore presents an opportunity for the government to incorporate security standards when developing e-government systems.

Social Issues	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Total
Transparent process	0 (0%)	76 (37.07%)	15 (7.32%)	109 (53.17%)	5 (2.44%)	205
Engagement	0 (0%)	0 (0%)	71 (34.63%)	121 (59.02%)	13 (6.34%)	205
Unnecessarily complex	0 (0%)	26 (12.68%)	115 (56.10%)	30 (14.63%)	34 (16.59%)	205
Convenient	0 (0%)	0 (0%)	0 (0%)	100 (48.78%)	105 (51.22%)	205
Privacy & Confidentiality	2 (1.00%)	25 (12.44%)	115 (57.21%)	57 (28.36%)	2 (1.00%)	201

Table 4.12 Responses on the social issues on regarding the online job application service

4.5.10 Social Issue - Trust

Respondents were asked to rate their level of trust when using the online services. This factor was to measure the respondent's feeling on whether they were confident in the way government was handling their confidential data. Table 4.13 shows that, 48.29% of the respondents indicated that they trust the online service while 5.85% highly trust the online service. However a sizeable 28.29% of the respondents indicated that they had little trust with the system while 16.59% indicated that they had very little trust in the service. This result would mean that an assurance carried on the delivery platform of the online service would help in increasing trust in the service hence increased utilization.

Social Issues	Don't Trust At All	Very Little Trust	Little Trust	Trust	Highly Trust	Total
Trust	2 (0.98%)	34 (16.59%)	58 (28.29%)	99 (48.29%)	12 (5.85%)	205

Table 4.13 Rating on how respondents trust the online job application service

4.5.11 Website Evaluation

Most e-government systems are offered over the internet, therefore to understand users' feel of the services it is important to get their views on the medium used to offer these online services. In order to achieve this objective we designed questions that captured respondents views on the websites used to offer the e-government services.

In the table 4.14 respondent's views are captured and tabulated. In this case of the Public Service Commission website evaluation, 33% of the respondents strongly agreed that the website is difficult to use and navigate and 38% were indifferent on the same evaluation parameter. This shows that the website needs to be redesigned to make it easy to use and navigate. However 14% and 12% strongly disagreed and disagreed respectively on the same.

On the second evaluation parameter on consistency of presentation of the website content, 35% of the respondents disagreed, which means that the public commission website need to be redone with this parameter in mind. Only 6% of the respondents agreed on this parameter.

On the parameters; the organization of the website is logical and clear, the information of the website is accurate and the website is up-to-date, the website scored well by posting 61%,

40% and 43% respectively that the respondents agreed on these three parameters. These percentages were the highest in these categories.

In the rest of the parameters; not difficult to use and navigate, presentation of the content is consistent throughout the website, organisation of the website is logical and clear, information on the website is accurate and up to date, content of the website is clearly written and easy to understand and help menu is useful, the website fared well.

PSC Website Evaluation						
Evaluation Parameters	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree	Total
I find the website difficult to use and navigate	28 (14%)	25 (12%)	78 (38%)	6 (3%)	68 (33%)	205
The presentation of content is consistent throughout the website	11 (3%)	2 (35%)	10 (3%)	150 (6%)	32 (1%)	205
The organization of the website is logical and clear	11 (5%)	8 (4%)	26 (13%)	126 (61%)	27 (13%)	198
The information on the website is accurate	11 (5%)	3 (1%)	61 (30%)	82 (40%)	47 (23%)	205
The information on the website is up-to-date	17 (8%)	32 (16%)	39 (19%)	89 (43%)	28 (14%)	205
The content of the website is clearly written and easy to understand	0 (0%)	42 (21%)	11 (6%)	138 (69%)	8 (4%)	199
The help menu is useful	3 (1%)	48 (23%)	51 (25%)	95 (46%)	8 (4%)	205

Table 4.14 Public Service Commission Website evaluation

4.5.12 Satisfaction in relation to Computer Skills

Majority 59.57% of the respondents with fair computer skills were slightly satisfied with the online service while 44.79% of respondents with good computer skills were satisfied with the service. These results are shown in table 4.15. There was a convergence of opinion regardless of the level of computer skills.

Satisfaction	Excellent	Fair	Good	Total
Very Disappointed	0 (0%)	0 (0%)	3 (1.46%)	3 (1.46%)
Disappointed	0 (0%)	3 (1.46%)	8 (3.90%)	10 (4.88%)
Slightly Satisfied	11 (5.37%)	56 (27.32%)	18 (8.78%)	85 (41.46%)
Satisfied	4 (1.95%)	21 (10.24%)	43 (20.98%)	68 (33.17%)
Very Satisfied	0 (0%)	15 (7.32%)	23 (11.22%)	38 (18.54%)
Total	15 (7.32%)	94 (45.85%)	96 (46.83%)	205

Table 4.15 Satisfaction based on computer skills on the Online job application service

4.5.13 Satisfaction in relation to Academic Level

Majority of middle level college graduates and university degree graduates were satisfied/slightly satisfied with the online system, however a proportion of the degree holders were very disappointed with the service. This could be as a result of high expectation of an e-government online service by this group as shown in table 4.16.

satisfaction	College	Graduate	O level	Total
Very Disappointed	0 (0%)	3 (1.46%)	0 (0%)	3 (1.46%)
Disappointed	2 (0.98%)	8 (3.90%)	0 (0%)	10 (4.88%)
Slightly Satisfied	47 (22.93%)	31 (15.12%)	7 (3.41%)	85 (41.46%)
Satisfied	37 (18.05%)	27 (13.17%)	4 (1.95%)	68 (33.17%)
Very Satisfied	10 (4.88%)	29 (14.15%)	0 (0%)	39 (19.02%)
Total	96 (46.83%)	98 (47.80%)	11 (5.37%)	205

Table 4.16 Satisfaction based on academic level on the Online job application service

4.5.14 Satisfaction in relation to Age

As indicated in the table 4.17 both age group 20-30 and 31-40 were satisfied/slightly satisfied with the online system. Age seem not to be a major factor in the level of satisfaction of online service users.

Satisfaction	20-30	31-40	41-50	51-60	Total
Very Disappointed	0 (1.46%)	0 (0%)	0 (0%)	0 (0%)	3 (1.46%)
Disappointed	0 (0%)	8 (3.90%)	2 (0.98%)	0 (0%)	10 (4.88%)
Slightly Satisfied	45 (21.95%)	32 (15.61%)	8 (3.90%)	3 (1.46%)	85 (41.46%)
Satisfied	34 (16.59%)	20 (9.76%)	14 (6.83%)	0 (0%)	68 (33.17%)
Very Satisfied	18 (8.78%)	14 (6.83%)	7 (3.41%)	0 (0%)	39 (19.02%)
Total	97 (47.32%)	74 (36.10%)	31 (15.12%)	3 (1.46%)	205

Table 4.17 Satisfaction based on age on the Online job application service

4.5.15 Satisfaction in relation to Gender

As shown in table 4.18, majority of the two genders considered in our research fell in slightly satisfied for females with 27.80% and satisfied for males with 33.17%. More females seem to be less satisfied with this online service as compared to men.

Satisfaction	Female	Male	Total
Very Disappointed	0 (0%)	3 (1.46%)	3 (1.46%)
Disappointed	2 (0.98%)	8 (3.90%)	10 (4.88%)
Slightly Satisfied	57 (27.80%)	28 (13.66%)	85 (41.46%)
Satisfied	46 (22.44%)	68 (33.17%)	68 (33.17%)
Very Satisfied	17 (8.29%)	22 (10.73%)	39 (19.02%)
Total	83 (40.49%)	122 (59.51%)	205

Table 4.18 Satisfaction based on gender on the Online job application service

4.5.16 Overall Satisfaction

The respondents indicated that 41.46% were slightly satisfied with the online job application system, 33.17% were satisfied and 1.46% were very disappointed as shown in table 4.19. This statistics show that, with the metrics used to evaluate the online job application, there is a need for improvement of this online service to raise the level of satisfaction to satisfied and above.

Satisfaction	Freq.	Percent	Cum.
Very Disappointed	3	1.46	1.46
Disappointed	10	4.89	6.35
Slightly Satisfied	85	41.46	47.81
Satisfied	68	33.17	80.98
Very Satisfied	39	19.02	100.00
Total	205	100.00	

Table 4.19 Overall satisfaction of respondents on the Online job application service

4.6 Results 2: KRA Online New Taxpayer Registration: Analysis of Responses

In this section, we give a detailed analysis of the responses we obtained from the 210 valid responses.

4.6.1 Respondents by gender

Table 4.20 indicates the respondents by gender. 70.39% of the respondents were males and 26.61% were females. Females responded poorly compared to the case of the Public Service Commission case where the response was almost equal.

Gender	Freq.	Percent	Cum.
Male	145	70.39	70.39
Female	61	29.61	100
Total	206	100	

Table 4.20 Respondents by gender

4.6.2 Respondents by Age

Table 4.21 show that majority of the respondents are young and therefore proving that ICT adoption and utilisation among the young is high comparing to the old. Of interest to note here is that none of the respondents aged 50 years and above responded to the online questionnaire. This may be an indication that adoption of ICT systems by the old generation is very minimal.

Age	Freq.	Percent	Cum.
20-30	70	33.98	33.98
31-40	106	51.46	85.44
41-50	30	14.56	100
Total	206	100	

Table 4.21 Respondents by Age

4.6.3 Respondents by Education Level

In this case of KRA new Taxpayer registration system none of the respondents was below college level of education. This could be as a result of that this service is more applicable to citizens above a certain age as shown in table 4.22.

Education-Level	Freq.	Percent	Cum.
College	96	46.6	46.6
Graduate	110	53.4	100
Total	206	100	

Table 4.22 Respondents by Education Level

4.6.4 Respondents by Computer Skills

Most of the respondents indicated that their computer skills are either good or excellent. Few of the respondents indicated that they have fair level of computer skills. Of interest to note is that none of the online consumers of this KRA service indicated that they have very poor or poor level of computer skills as shown in table 4.23. This implies that they may be higher consumption of e-government services if computer skills of the intended user is high. This result may also imply that the online system is very sophisticated and would require high levels of computer skills in order to consume it.

Computer-Skills	Freq.	Percent	Cum.
Fair	21	10	10
Good	79	37.62	47.62
Excellent	110	52.38	100
Total	210	100	

Table 4.23 Respondents by Computer skills

4.6.5 Financial/Economic Issues

This section measured the economic factors that affect citizen's utilization of e-government online services. Two factors, that is, cost saving and time saving were used in this group. Table 4.24 shows that, 70.95% of the respondents strongly agreed that it is cost effective to apply for Tax PIN online as compared to the manual Tax PIN application. 20% agreed on the same. 69.52% and 18.57% strongly agreed and agreed respectively on time saving as a result of using this online service. This may justify the essence of the government investing in e-government systems as the citizens are able to get the services efficiently. However a sizeable 6.67% were indifferent in that it saves money and time to use this KRA online service. This could be attributed to the speed of the internet or the online system. Availability of internet services could also be a factor in these results because one may be forced to travel to a place

near the city to get this service. This shows that there is need to improve the speed at which these services are accessible.

Financial Evaluation	strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total
Cost Saving	149(70.95%)	42(20%)	14(6.67%)	5(2.38%)	0(0%)	210
Time Saving	146(69.52%)	39(18.57%)	14(6.67%)	5(2.38%)	6(2.86%)	210

Table 4.24 Responses on the financial issues of the online Tax PIN registration service

4.6.6 Technical Issues

The first question rated the perception of online Tax PIN registration on the question of system speed. That is, if the respondents believed that it takes longer than necessary to complete the online Tax PIN registration. This statistics show that 29.05% respondents strongly agree, 32.38% agreed and 8.1% were indifferent on this. However 24.76% disagreed on the same. This could be as a result of respondents consuming the online service from different places with different internet connectivity speeds. Those who obtained this online service from high internet speed places probably disagreed with the statement. 20%, 28.57% of the respondents strongly agreed and agreed respectively that the system produced an error in the process of the Tax PIN registration. However 32.86%, 13.81% disagreed and strongly disagreed respectively on the same aspect. The respondents were equally divided in their responses on user friendliness, ease to use interface, easy to learn to use and comprehensive help facility qualities as shown in table 4.25. This can be interpreted to mean that the system quality, information quality and service quality of this online system may need to be improved to increase user's satisfaction.

Technical Issues	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total
Takes longer time than necessary to complete a task	61 (29.05%)	68 (32.38%)	17 (8.1%)	52 (24.76%)	12 (5.71%)	210
Possibility of System error	42 (20%)	60 (28.57%)	10 (4.76%)	69 (32.86%)	29 (13.81%)	210
Easy to use interface	50 (23.81%)	75 (35.71%)	10 (4.76%)	68 (32.38%)	7 (3.33%)	210
User friendly	47 (22.38%)	79 (37.62%)	19 (9.05%)	30 (14.29%)	35 (16.67%)	210
Easy to learn to use	45 (21.95%)	67 (32.68%)	1 (0.49%)	44 (21.46%)	48 (23.41%)	205
Comprehensive help facility	8 (3.81%)	71 (33.81%)	43 (20.48%)	46 (21.9%)	42 (20%)	210

Table 4.25 Responses on the technical issues of the online Tax PIN registration service

4.6.7 System Availability

E-government services are designed to be available to clients always. In our evaluation criteria one of the factors we used was on availability of the system for twenty four hours a day and seven days a week. Most respondents 58.48% polled that the KRA system is only available sometimes while a combined percentage of 57.14% polled that the system is either available or always available as shown in table 4.26. In this category the KRA system performs better than the PSC system.

Availability	Freq.	Percent	Cum.
Never Available	5	2.38	2.38
Available Sometimes	106	50.48	52.86
Available	71	33.81	86.67
Always Available	28	13.33	100
Total	210	100	

Table 4.26 Availability of the KRA system

4.6.8 Efficiency of the service

The last question in this group asked respondents to generally rate the efficiency of the online service. Majority of the respondents (54.24%) rated the online service as fair followed by 30.48% who rated the service as good and 14.29% as poor as shown in table 4.27. These results indicate that there is room for improvement in all aspects of the system. The online job application system performs slightly better than this system on this particular parameter.

Efficiency	Freq.	Percent	Cum.
Poor	30	14.29	14.29
Fair	116	55.24	69.52
Good	64	30.48	100
Total	210	100	

Table 4.27 Responses on efficiency of the online Tax PIN registration service

4.6.9 Social Issues

The social issues group incorporated the following factors: Trust in the system, Transparency, Engagement, Privacy and Convenience. As shown in tables 4.28, 58.1%, 24.76% of the respondents strongly agreed and agreed respectively that the Tax PIN online registration process is more open than the manual process. This statistic shows that more than half of the

citizens who use the system believe that the online system has introduced transparency in the process of acquiring Tax PIN from KRA. This provides the government the justification it requires in investing in e-government systems. However on the issue of engaging the online services seekers in the registration process, 33.97% of the respondents were indifferent indicating that there is a need by the e-government system implementers to involve the users more in the processes undertaken electronically. This engagement may be lead to higher utilization of the e-government online services. On complexity of the system, most respondents, 33.33%, disagreed on the question that the system is unnecessarily complex. However 29.52% and 17.62% strongly agreed and agreed respectively on the unnecessary complexity of the system. This result shows that quite a number of users would prefer the online service be simplified. On the question of convenient, 33.33% respondents strongly agreed and 49.05% agreed that the system is convenient to use.

Most respondents, 38.1% were indifferent when asked if they believed that the data/information they gave via the system is confidentially held and 21.9% disagreed on the same. This statistics show that the e-government online service users are not confident about handling of their personal data by the e-government system and this therefore presents an opportunity for the government to incorporate security standards when developing e-government systems. This would be improved by providing assurance messages on protection of privacy to online users.

Social Issues	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total
Transparent process	122 (58.1%)	52 (24.76%)	34 (16.19%)	2 (0.95%)	0 (0%)	210
Engagement	83 (39.71%)	19 (9.09%)	71 (33.97%)	36 (17.22%)	0 (0%)	209
Unnecessarily complex	62 (29.52%)	37 (17.62%)	38 (18.1%)	70 (33.33%)	3 (1.43%)	210
Convenient	70 (33.33%)	103 (49.05%)	12 (5.71%)	25 (11.9%)	0 (0%)	210
Privacy & Confidentiality	11 (5.24%)	73 (34.76%)	80 (38.1%)	46 (21.9%)	0 (0%)	210

Table 4.28 Responses on social issues regarding online Tax PIN registration service

4.6.10 Social Issue – Trust

Respondents were asked to rate their level of trust when using the online services. This factor was to measure the respondent's feeling on whether they were confident in the way government was handling their confidential data. Table 4.29 shows that, 45.85% of the respondents indicated that they trust the online service while 3.9% highly trust the online service. However a sizeable 21.46% of the respondents indicated that they had little trust with the system while 20.49% indicated that they had very little trust in the service. This result would mean that an assurance carried on the delivery platform of the online service would help in increasing trust in the service hence increased utilization. The issue of trust and security are key in the success of transactional online services. Online services users need to have enough faith that their financial information (i.e. credit card information) is safe before they can adopt an e-commerce system.

Social Issues	Don't Trust At All	Very Little Trust	Little Trust	Trust	Highly Trust	Total
Trust	17 (8.29%)	42 (20.49%)	44 (21.46%)	94 (45.85%)	8 (3.9%)	205

Table 4.29 Rating on how respondents trust the online Tax PIN registration service

4.6.11 Website Evaluation

Kenya has gained popularity worldwide for its innovative mobile phone money transfer system. The government of Kenya is riding on this popularity to offer some of its online services via the cell phones. However most e-government services are offered over the internet, and the two cases chosen for this study make use of the internet in offering the online services. In order to wholesomely evaluate this e-government system, this forum of presentation (website) was evaluated too.

In the table 4.30 respondent's views are captured and tabulated. In this case of the Kenya Revenue Authority website evaluation, 55.24% of the respondents disagreed that the website is difficult to use and navigate however 26.18% agreed on the same evaluation parameter. This shows that the website needs to be redesigned to make it easier to use and navigate.

On evaluation parameters; consistency of presentation of the website content, information of the website is accurate, website is up-to-date and the content of the website is clearly written and easy to understand, the KRA website performed well scoring more than 50%.

On the parameters; organization of the website is logical and clear and the website help menu is useful the KRA website scored slightly less than 50%. This information gives KRA the parameters to focus on and improve them when redesigning their website.

Evaluation Parameters	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total
Difficult to use and navigate	22 (10.48%)	55 (26.18%)	10 (4.76%)	116 (55.24%)	7 (3.33%)	210
Presentation of content is consistent	36 (17.14%)	112 (53.33%)	54 (25.71%)	8 (3.81%)	0 (0%)	210
Organization is logical and clear	35 (17.07%)	93 (45.37%)	64 (31.22%)	13 (6.34%)	0 (0%)	210
Information is accurate	43 (20.87%)	115 (55.83%)	24 (11.65%)	22 (10.68%)	2 (0.97%)	210
Information is up-to-date	45 (21.43%)	123 (58.57%)	22 (10.48%)	16 (7.62%)	4 (1.9%)	210
Content clearly written & easy to understand	54 (25.71%)	113 (54.81%)	15 (7.14%)	24 (11.43%)	4 (1.9%)	210
The help menu is useful	36 (17.14%)	95 (45.24%)	19 (9.05%)	56 (26.67%)	4 (1.9%)	210

Table 4.30 KRA website evaluation

4.6.12 Overall KRA Website rating

The last question on website evaluation queried the respondents on their general rating of the KRA website. Table 4.31 shows that majority of the respondents, 61.9%, rated the website as good.

Website Rating	Very Poor	Poor	Fair	Good	Excellent	Total
Website Rating	1 (0.48%)	3 (1.43%)	72 (34.29%)	130 (61.9%)	4 (1.9%)	210

Table 4.31 Over all KRA website rating

4.6.13 Satisfaction in relation to Computer Skills

Majority 36.19% of the respondents with excellent computer skills were satisfied with the online service while 19.05% of respondents with good computer skills were satisfied with the service as shown in table 4.32. There was a convergence of opinion on satisfaction regardless of the level of computer skills.

Computer Skills	Very Poor	Poor	Fair	Good	Excellent	Total
Disappointed	0 (0%)	0 (0%)	3 (1.43%)	18 (8.57%)	12 (5.71%)	33
Slightly Satisfied	0 (0%)	0 (0%)	14 (6.67%)	20 (9.52%)	18 (8.57%)	52
Satisfied	0 (0%)	0 (0%)	2 (0.95%)	40 (19.05%)	76 (36.19%)	118
Very Satisfied	0 (0%)	0 (0%)	2 (0.95%)	1 (0.48%)	4 (1.9%)	7
Total	0 (0%)	0 (0%)	21 (10%)	79 (37.62%)	110 (52.38%)	210

Table 4.32 Satisfaction based on computer skills for the online service

4.6.14 Satisfaction in relation to Academic Level

Majority of college (diploma holders) and degree holders were satisfied/slightly satisfied with the online system, however a sizeable of the both diploma and degree holders were disappointed with the service. Table 4.33 shows the specific percentages. This shows that improvement of this service is needed.

Education Level	O Level	College	Graduate	Total
Disappointed	0 (0%)	16 (7.77%)	16 (7.77%)	32
Slightly Satisfied	0 (0%)	36 (17.48%)	16 (7.77%)	52
Satisfied	0 (0%)	41 (19.9%)	74 (35.92%)	115
Very Satisfied	0 (0%)	3 (1.46%)	4 (1.94%)	7
Total	0 (0%)	96 (46.6%)	110 (53.4%)	206

Table 4.33 Satisfaction based on education level for the online service

4.6.15 Satisfaction in relation to Age

As indicated in table 4.34, the age group 20-30 years lead among those disappointed by this online service. However age group 31-40 lead among those satisfied/slightly satisfied with the online system. Age seem not to be a major factor in the level of satisfaction of this online service.

Age	20-30	31-40	41-50	51-60	Total
Disappointed	15 (7.28%)	14 (6.8%)	3 (1.46%)	0 (0%)	32
Slightly Satisfied	4 (1.94%)	34 (16.5%)	14 (6.8%)	0 (0%)	52
Satisfied	47 (22.82%)	58 (28.16%)	10 (4.85%)	0 (0%)	115
Very Satisfied	4 (1.94%)	0 (0%)	3 (1.46%)	0 (0%)	7
Total	70 (33.98%)	106 (51.46%)	30 (14.56%)	0 (0%)	206

Table 4.34 Satisfaction based on age for the online service

4.6.16 Satisfaction in relation to Gender

As shown in table 4.35 males lead in all categories of satisfaction. However it is to be noted that a large number of the respondents were male.

Gender	Male	Female	Total
Disappointed	30 (14.56%)	2 (0.97%)	32
Slightly Satisfied	31 (15.05%)	21 (10.19%)	52
Satisfied	81 (39.32%)	34 (16.5%)	115
Very Satisfied	3 (1.46%)	4 (1.94%)	7
Total	145 (70.39%)	61 (29.61%)	206

Table 4.35 Satisfaction based on gender for the online service

4.6.17 Over all Satisfaction

Majority of the respondents 56.19% indicated that were satisfied with the online Tax PIN registration system, 3.33% were very satisfied and 1.46% were very slightly satisfied. A significant proportion of 15.71% were disappointed with this online service as shown in table 4.36. This statistics certainly show that though the majority of the respondents are satisfied with the online service, there is need to improve the service.

Satisfaction	Freq.	Percent	Cum.
Disappointed	33	15.71	15.71
Slightly Satisfied	52	24.76	40.48
Satisfied	118	56.19	96.67
Very Satisfied	7	3.33	100
Total	210	100	

Table 4.36 Overall satisfaction of respondents on the Online Tax PIN Registration service

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

E-government field is a very exiting field. Developing countries are aiming to leverage ICTs in the different sectors of the economy in order to spur growth of their economies. In Kenya, the development blue print referred to as vision 2030, sites ICT as one of the key enabler that is going to propel her to a medium income country in the year 2030. Implementation of e-government is an expensive affair and numerous evaluations of e-government projects need to be carried out periodically to ensure their success.

Kenya is in its nascent stages of e-government implementation and for that matter government organisations charged with the responsibility of implementing e-government projects need to adopt the culture of post implementation evaluation. This will not only increase the rate of success of e-government projects but will also justify investment the government does in funding them.

In this study we sought to identify factors that can be used to evaluate e-government services from a citizen's point of view. As indicated in chapter three above, four groups of issues were identified, that is, technical, financial/economical, social and delivery platform. The metrics used under each of this group took in to account the level of e-government implementation that Kenya is currently in which is the interactive phase.

The findings, as shown in chapter five, indicate that majority of e-government service users are somewhat satisfied with the services. In our first case, Public Service Commission online job application service, 1.46% of the respondents were very disappointed, 4.89% were disappointed, 41.46% were slightly satisfied, 33.17% were satisfied and 19.02% were very satisfied. On one of the parameters used in the technical group namely availability, 1.95% of the respondents indicated that the e-service is never available, 59.02% indicated that its available sometimes, 38.54% said that its available and only 0.49% said that its always available. On efficiency of this e-service, 1.46% of the respondents rated it as very poor, 6.83% as poor, 52.68% as fair, 36.10% as good and 2.93% as very good. In our second case, Kenya Revenue Authority online new taxpayer PIN registration, none of the respondents were very disappointed, 15.71% were disappointed, 24.76% were slightly satisfied, 56.19% were

satisfied and 3.33% were very satisfied. On one of the parameters used in the technical group namely availability, 2.38% of the respondents indicated that the e-service is never available, 50.48% indicated that its available sometimes, 33.81% said that its available and only 13.33% said that its always available. On efficiency of this e-service, none of the respondents rated it as very poor, 14.29% as poor, 55.24% as fair, 30.48% as good and none as very good. Generally the KRA online new taxpayer PIN registration performs better on technical aspects than the PSC online job application service. However on the delivery platform (website), PSC performed well on ease to use and navigate parameter compared to the KRA website.

However, on other specific metrics used in evaluating different aspects of the e-government system, the ratings by the users range from excellent to very poor. In particular, both the e-government systems considered in this study require special attention to improve the technical aspects and the delivery platform. These are information quality, system quality and website.

5.2 Conclusion

This study aimed at identifying factors that can be used in e-government online services evaluation from the citizen's point of view and carrying out evaluation on selected e-government systems. One major reason for doing evaluations of e-government online services is to take actions based on the results of the evaluation to generate change and betterment.

This is actually an important fact due to the expensive failure of Information Systems.

The work presented in this project describes an effort to provide a set of clear and useful e-government evaluation factors that can be used to help achieve better citizen services presentation and utilization. A critical analysis of the major current evaluation approaches revealed that although each of these approaches has its strengths and merits, none of them was custom made for developing country on the main issues that affect e-government evaluation from a citizen point of view. Hence, evaluation factors were proposed that cover the technical, economical/financial, social and delivery platform affecting citizen utilization of e-government services.

Using the four groups identified in this study, that is, financial/economic, technical, social and delivery platform to carry out individual evaluations of the two selected e-government online service, the results showed a need to improve the services on all the four areas. Factors like availability of e-government systems and ease of use of the delivery platform, which are key to provision of online services to the citizens did not perform well as the level of satisfaction by users was moderate. Although it is an achievement to offer government services online, it

the desire of the government to attract clients to consume these online services. Regular evaluation and thereby improvement of these e-services will go along way in increasing citizen's utilisation and satisfaction in them.

5.3 Recommendations

Evaluations of e-government software projects are important for various reasons, key among them are, justify funding of the e-government system, justify adoption and utilisation of the system and improvement of the e-government system. The major reason for government undertaking to implement a software project and ultimately offer an e-service, is the desire to serve its citizenry (client) in an efficient and effective manner.

Based on the findings of this study, the e-government systems implementers should:

- Publicise the expected benefits of the e-services they intend to provide
- Improve the technical aspects of their systems to ensure high reliability and availability
- Simplify the e-service they intend to offer
- Make e-government systems evaluation a regular exercise in order to continuously get feedback from the clients and thereby improve the online services

5.4 Further Research

E-government services are offered through other platform other than websites. In Kenya the growth of mobile phone applications has gained popularity with money transfer services leading in this front. The government is offering some of its services through the mobile phones. This presents an interesting area of research. Development of an evaluation framework to evaluate mobile phone based online services offered by the government could help build a holistic e-government services evaluation framework.

Furthermore as Kenya progresses from interactive phase of e-government implementation to transactional phase where e-government services are not only offered online but payment of these services is done electronically, this will present another area of research.

References

1. Castelnovo W and Simonetta M, (2007). The Evaluation of e-Government projects for Small Local Government Organisations, *The Electronic Journal of e-government* Volumes 5 Issue 1, pp 21-28 available online at www.ejeg.com
2. Sarmad Alshawi and Harmid Alalwany, (2009). E-government Evaluation: Citizen's Perspective in Developing Countries, *Information Technology for Development*, Vol. 15 (3) 193-208
3. R. Stockdale, C. Standing, (2006). CCP, *European Journal of Operational Research* 173 (2006) 1090 - 1102
4. Measuring and Evaluating E-government in Arab Countries, High Level Seminar on Measuring and Evaluating E-Government and 3rd Meeting of Working Group 2 on E-Government and Administrative Simplification (Dubai, 12-13 March 2007)
5. Marian Carcary, (2008). The Evaluation of ICT investment Performance in terms of its Functional Deployment; A study of Organisational Ability to Leverage Advantage from the Banner MIS in Institute of Technology in Ireland
6. Jianwei Liu, Zsofia D., Martel R., and Alexander K, (2008). E-government Project Evaluation: An integrated Framework, Springer Verlay Berlin Heidelberg
7. Caroline M., (2007). Public Value and Leadership, Exploring the Implication, Centre for Excellence in Leadership (CEL)
8. Colin T., (2008). Public Value: A Competing Values Approach, Herbet Simon Institute, Manchester Business School, The work Foundation
9. Research, Innovation and Technology Sector, Medium term expenditure frame-work 2009/10 – 2011/12 Report
10. Al-Yaseen,H, Al-Jaghoub, S, Al-Shorbaji, M and Salim, M. (2010) "Post-Implementation Evaluation of HealthCare Information Systems in Developing Countries" *The Electronic Journal Information Systems Evaluation Volume 13 Issue 1 2010*, (pp9 - 16), available online at www.ejise.com
11. Vasconcelos A, Sousa P and Tribolet J (2007) "Information System Architecture Metrics: an Enterprise Engineering Evaluation Approach" *The Electronic Journal Information Systems Evaluation Volume 10 Issue 1*, pp 91 - 122 , available online at www.ejise.com
12. Wojciech P, Irani Z (2008). Information systems evaluation in context– Impact of the corporate level, European and Meditarian Mediterranean Conference on Information Systems 2008 (EMCIS2008) May 25-26 2008, Al Bustan Rotana Hotel, Dubai

13. Raid Moh'd Al-adaileh (2009). An Evaluation of Information Systems Success: A User Perspective - the Case of Jordan Telecom Group, *European Journal of Scientific Research* ISSN 1450-216X Vol.37 No.2 (2009), pp.226-239 © Euro Journals Publishing, Inc. 2009 <http://www.eurojournals.com/ejsr.htm>
14. P. Fitsilis, L. Anthopoulos, V. C. Gerogiannis (2009). Assessment Frameworks of E-Government Projects: a Comparison, PCI 2009 Conference Proceedings
15. Gupta M. P and Jaijit Bhattacharya, Evaluating e-government
16. Joppe, M. (2000). The Research Process. Retrieved February 25, 1998, from <http://www.rverson.ca/~mijoppe/rp.htm>
17. Waema, T. and Mwabuli C., (2009). Ex Ante Evaluation of Information and Communication Technology Projects; Case Studies of Kenyan Universities, *International Journal of Computing and ICT Research*, ISSN 1818-1139 (Print), ISSN 1996-1065 (Online), Vol.3, No.1 pp. 65-76, June 2009.
18. DeLone & McLean (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update, *Journal of Management Information Systems / Spring* 2003, Vol. 19, No. 4, pp. 9–30.
19. Farbey, B., Land, F.F. and Targett, D., (1995). A Taxonomy of Information-Systems Applications - the Benefits Evaluation Ladder'. *European Journal of Information Systems*, 4(1): 41-50.
20. Beynon-Davies, Paul (2005). Constructing electronic government: the case of the UK inland revenue. European Business Management School, University of Wales Swansea.
21. Davis, F. D, (1989). "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, Vol 13 No 3, pp319-339.
22. THE CHAOS Report (1994), The Standish Group, http://www.standishgroup.com/sample_research/chaos_1994_1.php. Viewed April 17, 2008
23. Symons, V.J. (1991). 'Impacts of Information Systems: Four Perspectives'. *Information and Software Technology*, 33(3): 181-190.
24. Symons, V.J. (1991). 'A review of Information Systems evaluation: content, context and process'. *Journal of the Operational Research Society*, 1(3): 205-212.
25. Serafeimidis, V. and Smithson, S. (1999). 'Rethinking the approaches to information systems evaluation'. *Logistics Information Management*, 12(1/2): 94-107.

26. Serafeimidis, V. and Smithson, S. (2000). 'Information systems evaluation in practice: a case study of organizational change'. *Journal of Information Technology*, 15(2): 93-105.
27. Carter, L. & Belanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance. *Information Systems Journal*, 15, 5-25.
28. Zikmund, W (2003). *Business Research Methods*, South Western Australia
29. Young, D., and Benamati, J. Differences in public Web sites (2000). The current state of large U.S. firms. *Journal of Electronic Commerce Research*, 1, 3 (2000) (available at www.csulb.edu/web/journals/ject/p_i.htm).
30. Vishanth, W & Shafi, A (2009). Understanding Citizens' Behavioural Intention in the Adoption of E-government Services in the state of Qatar. 17th European Conference on Information Systems
31. Piyush, G. (2007). Challenges and Issues in e-government Project Assessment

Appendix 1



University of Nairobi
School of Informatics and Computing
E-government Software Project Evaluation Questionnaire

My name is Joseph Irungu, a student at the University of Nairobi School of Computing and Informatics, undertaking a research project titled: ***A framework for E-government software project evaluation in Kenya***. The focus of my research is to test the validity of a framework construct.

The research is purely academic, confidential and will be solely used for that purpose. Your details or data provided will not be passed to any third party without your prior permission.

I request to take a moment of your time to answer the questions below and email back the questionnaire to me through any of the addresses provided below. I will greatly appreciate your frank responses to these questions. Please feel free to contact me for any clarifications.

Joseph Irungu

Email: joseph.irungu@kenya.go.ke, munyonge@yahoo.com

Note

To answer, please CHECK ONE option per question.

Personal Information

Gender

(a) Male

(b) Female

Age Bracket

(a) 20 – 30

(b) 31 – 40

(c) 41 – 50

(d) 51 – 60

Level of Education

(a) O level

(b) College

(c) Graduate

How would you rate your computer skills?

(a) Very Poor (b) Poor (c) Fair (d) Good (e) Excellent

Financial/Economic

1. To what extent do you agree or disagree with the following statements about the Public Service Commission Online Recruitment and Selection Database System

i. That it is cheaper to apply for a job online compared to manual job application (cost saving)

a) Strongly Agree b) Agree c) Neither Agree nor Disagree d) Disagree e) Strongly Disagree

ii. That it is faster to apply for a job online compared to manual job application (time saving)

a) Strongly Agree b) Agree c) Neither Agree nor Disagree d) Disagree e) Strongly Disagree

Technical Issues

2. Are you aware of any service level for this online service

i. Yes

ii. No

3. If yes (in 2 above) how would you rate the compliance level

(a) Very low (b) low (c) fair (d) good (e) very good

4. To what extent do you agree or disagree with the following statements

i. The Public Service Online Job application system takes more time than necessary to complete the online job application

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

ii. The System brings at least one error message in the process of executing the online job application exercise

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

5. Is the system available anytime you want to use it?

(a) Never Available (b) Available Sometimes (c) Available (d) Available Always

6. To what extent do you agree with the following statements about Public Service Online Job Application System

i. The system has an easy to use interface

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

ii. The system is user friendly

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

iii. *The system is easy to learn to use it*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

iv. *The system has a comprehensive help facility*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

7. *How would you rate the efficiency of this service*

(a) Very Poor (b) Poor (c) Fair (d) Good (e) Very Good

Social Issues

8. *To what extent do you trust the online job application service offered by the system?*

(a) Don't Trust it at all (b) Have very little Trust (c) Have little Trust (d) Trust it (e) Highly Trust

9. *To what extent do you agree or disagree with the following statements about the online job application system process*

i. *That the process is more transparent/open than the manual process*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

ii. *That am more engaged in the process than in the manual process*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

10. *To what extent do you agree or disagree with the following statements about the Online Job application system*

i. *The system is unnecessarily complex*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

ii. *The system is convenient to use*

(a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

11. *To what extent do you agree or disagree with the following statement*

i. *The data/information you give while using the system is held privately and confidentially*

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

12. Please rate your overall satisfaction with this online service

- (a) Very Disappointed (b) Disappointed (c) Slightly Satisfied
(d) Satisfied (e) Very Satisfied

Website Evaluation

13. To what extent do you agree or disagree with the following statements about the Public Service Commission website

i. I find the website difficult to use and navigate

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

ii. The presentation of content is consistent throughout the website

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

iii. The organization of the website is logical and clear

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

iv. The information on the website is accurate

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

v. The information on the website is up-to-date

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

vi. The content of the website is clearly written and easy to understand

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

vii. The help menu is useful

- (a) Strongly Agree (b) Agree (c) Neither Agree nor Disagree (d) Disagree (e) Strongly Disagree

viii. What is your over all rating of the Public Service of Kenya website

- (a) Very poor (b) Poor (c) Fair (d) Good (e) Excellent

Thank you very much for your participation