

**E-GOVERNMENT ADOPTION: THE CASE OF USER
COMMUNITY WITHIN PUBLIC UNIVERSITIES IN
NAIROBI**

BY

AGUYO SAMUEL OYIEKE

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DECLARATION

This research work is my original work and it has not been presented for the award of a University degree.

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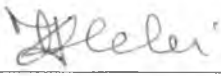
Date: 15/11/2011

Aguyo Samuel Oyieke

D61/70353/2007

University Supervisor

This project has been subjected with my approval as the university supervisor.

Signed:  _____

Date: 15/11/2011

Mr Joel K. Lelei

Department of Management Science

University of Nairobi

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DEDICATION

To my Wife and Children

ABSTRACT

This study concerns identifying the factors that influence the adoption of e-Government and the inherent benefits. E-government is seen as a way to digitally enable public sector agencies to manage relationships with citizens, businesses and not for profit organisations and therefore its adoption is expected. However, there is little knowledge in its adoption particularly from the consumer's perspective. This study was hence undertaken with two objectives of determining the factors that influence the consumers in the adoption of e-government services and to evaluate the benefits that consumers derive from the use such services.

The survey method was adopted as an appropriate research approach to address the adoption trends. The sample was drawn from students in public universities due to their unique requirements. Three public universities and a constituent college were selected for the study with a sample size of 50 students from each. Data was collected using a questionnaire drawn on a five point Likert type scale through a face to face interview. One hundred and forty responses were received out of 150 questionnaires. The data were analysed using descriptive statistics consisting of frequencies, percentages and weighted means.

Information systems success model framework was used to distil issues that influence adoption of e-Government services. The study found out that factors that negatively influence adoption were; unreliability, incompleteness and out of date information. Secondly, non availability of the system and slow speed of access and download were system quality challenges. Thirdly, lack of good design, undependable system and a

system that lacked empathy considering the non-machine environments were service quality challenges. Lastly, the expected benefits are a comprehensive portal that links with other related service, these factors were rated poorly. The study confirms that e-Government services are convenient, saves on travel time and enhances personal safety of users.

From the literature, various studies have aptly classified the various consumers of e-Government services. These are businesses, government departments, employees, citizens and non-governmental organisations. Each group pursue a different objective which the service must address for successful adoption. The adoption process focuses on the mental process through which an individual passes from hearing about an innovation to final adoption. The growth of mobile telephony, broadband services, reducing cost of mobile handsets and cloud computing are catalysing environments for internet access and application deployment respectively. For the portals to meet the demands of the user, designers should deploy technologies that simulate near life situation.

The study recommends that public agencies provide the e-Government users with better on-line services regarding the man-machine interaction and operation assistance in end-user computing environments. The current authentication measures are weak and can be strengthened with the adoption of proper credentials. Mobile telephony is taking a centre stage as an access tool for e-government services. This is due to its near ubiquitous nature facilitated by rapidly expanding network coverage. Due to increasing dependency of the mobile telephony, it is imperative for the designers of the portals to incorporate mobile technologies.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
DEDICATION	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	vi
LIST OF FIGURES	viii
LIST OF TABLES	ix
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the study	1
1.1.2 The context of e-Government and public universities.....	3
1.2 Statement of the problem	6
1.3 Research Objectives	8
1.4 Value of research to theory and practice.....	8
CHAPTER TWO: LITERATURE REVIEW.....	10
2.1 Introduction	10
2.2 Adoption process and challenges	11
2.2.1 Catalysts in the e-Government adoption	13
2.3 Theoretical framework	15
2.4 Evaluation.....	22
CHAPTER THREE: RESEARCH METHODOLOGY	23
3.1 Research design	23
3.2 Population and sampling	23
3.4 Data collection.....	24
3.5 Data Analysis.....	24
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION	25

4.1	Introduction	25
4.2	Demographic indicators	25
4.2	Information Quality.....	29
4.3	System Quality	31
4.4	Service Quality.....	33
4.5	Service Benefits.....	35
4.6	Discussions.....	37
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....		39
5.1	Introduction	39
5.2	Summary of Findings.....	39
5.3	Overall Conclusion.....	40
5.5	Recommendations	41
5.6	Areas for further research.....	42
REFERENCES		43
APPENDICES		51
Appendix 1: Questionnaire.....		51
Appendix 2: Introduction letter.....		55

LIST OF FIGURES

Figure 1: Information Systems Success Model	16
Figure 2: Technology Acceptance Model.....	20
Figure 3: Diffusion of Innovation Theory	21
Figure 4: Location of Access	28
Figure 5: Means of Access.....	29
Figure 8: Higher Education Loans portal.....	31
Figure 7: Student login screen – HELB	33
Figure 8: Student login screen - University of Nairobi.....	33

LIST OF TABLES

Table 1: Dimensions of Information Quality construct	17
Table 2: Dimensions of System Quality construct	18
Table 3: Five Dimensions of SERVQUAL in the Online Context.....	19
Table 4: List of selected universities	23
Table 5: Area of residence	25
Table 6: Gender.....	26
Table 7: Age rages	26
Table 8: Year of study at university.....	27
Table 9: Information quality dimensions	30
Table 10: System quality dimensions	32
Table 11: Dimensions of service quality	34
Table 12: Benefits of e-Government.....	36

ACRONYMS

3G	Third Generation
CARD	Computer Aided Administration of Registration Department
CCK	Communication Commission of Kenya
HE	His Excellency
HELB	Higher Education Loans Board
ICT	Information and Communication Technologies
KNEC	Kenya National Examination Council
LAIFOMS	Local Authorities Integrated Information Management System
LO	Low Income
LTE	Long Term Evolution
OECD	Organisation for Economic Co-operation and Development
PKI	Public Key Infrastructure
SMS	Short Message Service
TIVET	Technical, Industrial and Vocational Educational Training
USD	United States Dollar

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Governments the world over are continuously under pressure by the citizens to provide quality and timely services. As a result, governments are seeking better ways of providing efficient services. Information and Communication Technologies (ICT) provides an opportunity to efficiently deliver these services to the citizens. The Kenya government is therefore changing its strategy and adopting ICT as a new way of delivering government services. To show commitment, the government established the e-Government secretariat in 2004 to fast track electronic service provision in the public sector.

Definitions of e-Government emerge that reflect different priorities in government strategies, and shift as priorities change and progress is made. As outlined in the E-government Strategy (GoK, 2004), e-Government is the use of information technology to support government operations, provide investments that are needed in people, tools, policies, processes, engage citizens, and provide government services. United Nations University (n.d.) considers e-Government as the use of ICT particularly the Internet, as a tool to achieve better government. The World Bank (London School of Economics, n.d.), refers to e-Government as the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government.

Al-Jaghoub Saheer et al (2010), classify e-Government in terms of activities and delivering models into four categories: the Government to Citizens or Government to Customer (G2C); Government-to-Business (G2B); Government-to-Employees (G2E); and Government-to-Government (G2G). In the Kenyan context, since its inception in 2004, the services that the government is offering are primarily G2C which include public service job applications, university registrations, tracking of national identification cards and passports by applicants, national examination results inquiries, corruption reporting and Higher Education Loan processing. For G2B, the services offered are Business licensing, Customs services and Tax returns.

E-Government services are delivered through a web-portal – a single sign-on platform. Bwalya (2009) emphasizes that this portal is used for information exchange or a platform through which citizens and businesses can make decisions. Lara et al, (n.d.) describe web portals as entry points for information presentation and exchange over the Internet, used by a community of interest. The purpose of any web portal is to provide an effective communication forum for its members. Chung (2002) describes a portal as a web-based front-end application that allows dispersed sources of information to be linked together.

The Government can access and manage all the data and information while providing users with the opportunity to customize what they need from information sources (as cited in Ebrahim & Irani 2005). Laudon and Laudon (2007) consider a portal as a single secure environment that integrates business functions. A portal is an information system. Laudon and Laudon (2007) describe information to mean data that have been shaped into a form that is meaningful and useful to human beings. Therefore, technology deployed is

expected to make information search, access, extraction, interpretation and processing simple and a less time-consuming task.

1.1.2 The context of e-Government and public universities

E-Government Strategy (GoK, 2004) outlines the general objectives which are; to offer better and efficient delivery of government information and services to the citizens, promote productivity among public servants, encourage participation of citizens in government and empower all Kenyans in line with development priorities. The strategy has specific objectives which are; 1) Improve collaboration between government agencies through reduction in the duplication of effort and enhance efficiency and effectiveness of resource utilisation, 2) Reduce transaction costs for the government, citizens and the private sector through the provision of products and services electronically and, 3) Provide a forum for citizen's participation in government activities.

On this strength, government agencies have started deploying e-Government services as a condition. Notably, Higher Education Loans Board (<http://www.helb.co.ke/>), Ministry of Higher Education Science and Technology (<http://www.scienceandtechnology.go.ke/>), Ministry of State for Immigration and Registration of Persons (<http://www.mirp.go.ke/>) and University of Nairobi (<http://smis.uonbi.ac.ke/>). Higher Education Loans Board – HELB, Immigration and various university portals provide services that primarily benefit students. HELB has posted online loan application forms to prospective needy students. The Ministry of State for Immigration and Registration of Persons has posted passport application forms on its website. On the other hand, students at the University of Nairobi can now register for courses online and even book rooms online.

Students enrolled in institutions of higher learning stands at 177,735 in 2008/9 academic year (Economic Survey, 2010) out of this, about 28,155 are regular students from 20 universities and colleges (<http://jab.uonbi.ac.ke/>) who process loans from HELB. When these students make physical visits to respective government offices to obtain forms, the total travel and processing time is costly to both the students and the government.

Other concerted efforts to avail access terminals to students are from the Ministry of Information and Communication. A scheme funded by the World Bank and implemented by The Kenya ICT Board provides a loans scheme to students to purchase laptops. Currently, the scheme has loaned 15,000 laptops to university students (<http://www.wezesha.co.ke/>). Similarly, Kenya ICT Board is facilitating the establishment of *Pasha* Centres (Digital Villages) in all the constituencies in the country. To ensure sustainably, the Board give operators loans with low interest rates. These centres would be points of Internet access for citizens without access terminals (<http://www.ict.go.ke/>).

India has longer experience with e-Government. In the federal state of Andhra Pradesh, Computer Aided Administration of Registration Department (CARD) implemented in the lands office has recorded a number of adoption benefits. Satyanarayana (n.d.) did a comparison between manual system of land registration process and under CARD. Title search under manual system took seven days, while using CARD it took one hour. To obtain certified copy of a document took three days in a manual system while under CARD, took thirty minutes. In total, estimated saving of 70 million man hours of citizens time value at USD 35 million while the investment on the system was USD 6 million.

Adoption of e-Government is dependent upon three constructs of 1) Information Quality; accuracy, content, format and timeliness; 2) System Quality; Navigation, ease of use, response time and security; 3) Service Quality; tangibles, reliability, responsiveness, assurance and empathy. In Kenya the adoption of e-Government can be summarized by the president's statement that states; "Effective and operational e-Government will facilitate better and efficient delivery of information and services to the citizens, promote productivity among public servants, encourage participation of citizens in Government and empower all Kenyans" (H.E. Hon. Mwai Kibaki, President of Kenya, n.d.)

E-Government as illustrated portends benefits to the citizens. When fully implemented, the benefits are; a) improved access to government resources, b) reduced service processing costs and, c) enables organizations to provide a higher quality of service. For the government, there are savings in terms of reusable forms and services are offered uninterrupted throughout the year without direct involvement of employees. These are benefits that have been realised and documented in other countries mostly in Europe where OECD has taken the lead. The conditions in Europe are different due to high levels of development. It was therefore needful to conduct a study within the context of a developing economy.

1.2 Statement of the problem

The government is putting a lot of efforts to provide services online. This is in response to demands by citizens and businesses of easy access to government services and a reduction in bureaucratic processes. Some of these services are student loan processing, online registration of courses, passport application and business registrations. United Nations (2010) affirms that e-Government is a powerful tool for human development and essential to the achievement of the internationally agreed development goals including the Millennium Development Goals.

For the government, it is adopting e-Government services to pursue its other objectives. These are; increase its efficiency in service delivery, developing infrastructure and optimise its use, transmit data securely and make developments reusable. When this is achieved, the benefits are cross-cutting. For example, fewer citizens would be travelling therefore lowers carbon emission (OECD, 2009). Reusability of forms reduce the need to print which cut cost on supplies and the number of trees cut to manufacture that paper.

Dada (2006) points out that most implementations of e-government in developing countries fail, with 35 percent being classified as total failures for the reason that e-Government was not implemented or was implemented but immediately abandoned. Fifty percent as partial failures that major goals were not attained and or there were undesirable outcomes.

E-government implementation in Kenya like other developing countries is faced with challenges (Schuppan 2009; Dada, 2006; Ndou, 2004). A review of existing websites and portals for HELB and Immigration points at lack of quality particularly semantic

technologies and seamless integration. In a case where these agencies are seamlessly integrated, the module on fee collection at the university will obtain update from HELB; on the other hand, KNEC would update the academic module at the university. Issues of Personal Identification Numbers – PIN would be handled at the point a student is graduating. Lastly, HELB could obtain student details from the National Registration Bureau.

Students applying for higher education loans can now download loan application forms through the HELB website. The downloaded forms are printed, filled and submitted at an office. In a case where technology was used, the entire process can be conducted online using the portal and mobile telephony services. Some universities have adopted student management system as part of e-government and are already processing online registration of courses, room booking and fee management. The level of success is varied. Notable problems are frequent system outages and lack of standard formats.

Ochara and Van Belle (2008) studied managerial processes involved in the adoption of E-Government within Local Authorities in Kenya and concluded that, the projects were disaggregated, with weak mobilization of actors. Waema and Mithula (2007), delved into the Local Authority Integrated Financial Operations Management System (LAIFOMS) as a form of e-Government. The thrust of the study was to investigate the potential of ICT in improving governance in local authorities. E-Government is envisaged to fundamentally improve governance in developing countries as seen in the eyes of international development partners (Ochara, 2008). Kamar and Ongondo (2007) evaluated the impact of e-Government on management and use of government information in Kenya. The findings were that the government was still held back by legislation on secrecy and lack

of transparency. If relevant and timely information to its citizens was availed online, it would facilitate decision making. Therefore, citizens would adopt the service if they see value in it and if the factors are favourable. Considering this, the following questions are addressed: What are the factors that influence the adoption of e-government services? And are users getting value out of e-government service?

1.3 Research Objectives

The overall objective of this study is to determine the core issues that affect the adoption of e-Government services in Kenya with public universities as a case. The specific objectives are;

- To determine the factors that influence the consumers in the adoption of e-government services.
- To evaluate the benefits that consumers derive from e-government services.

1.4 Value of research to theory and practice

The research findings will contribute to the Information Systems Success theory in evaluating information systems provision in the public sector. This theory has been used to evaluate e-commerce portals (Molla & Licker, 2001; Cheung & Lee, 2005).

The research findings will be useful in isolating factors that influence the adoption of e-Government services. This will inform Information System (IS) practitioners in the public sector on how they can design and deploy better e-Government portals. The directorate of e-government would incorporate the factors while developing system structures and policies.

The study will enrich a body of knowledge in the area of digital service delivery in the public sector. Information Systems is cross cutting in a number of disciplines and will be of academic value to both public administration and IS researchers.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter two contains literature on previous studies that have been conducted in the field of e-Government. The concept is still new with a few publications on print form. However, there are a number of studies that has been done which is available online. Most of the literature used in this study was obtained from online sources. E-Government may refer to a number of things depending with the objectives of the government. Laudon and Laudon (2007) refer to e-Government as the application of the Internet and networking technologies to digitally enable government and public sector agencies' relationships with citizens, business, and other arms of government. On the other hand, according to GoK (2004), e-Government is the use of a range of Information and Communication Technologies (ICTs), such as the Wide Area Networks, Internet, and Mobile Computing, by government agencies to transform government operations in order to improve effectiveness, efficiency, service delivery and promote democracy. It is the use of information technology to support government operations, provide investments that are needed in people, tools, policies, progresses, engage citizens, and provide government services.

Ebrahim and Irani (2005), outline a framework of e-Government architecture which is in four layers. Access layer, which involve channels that government users can access the various government services. e-Government layer, is about integrating digital data of various organisations into a web-portal of government services, in the form of a one-stop e-governmental portal. e-Business layer is focused on using ICT applications and tools to harness a network of trust, knowledge and information processing that takes place within

and between organisations. Infrastructure layer, building an information community by using e-business layer applications in an efficient manager requires a technology infrastructure that reaches out to all parts of public sector organisation.

The recipient of e-government services can be classified (Fang, 2002; Al-Jaghoub Saheer et al, 2010) as Government to Employees (G2E) a service for civil servants. Maintenance of an internal efficiency and productivity of the government agencies: optimization, automation and informatization of administrative process. Government to Government (G2G), a service for government agencies. Maintenance of effective interdepartmental interaction on federal, regional and local level of the government for realization of the government functions. Government to Citizens (G2C), a service for the Citizens. Government to Business (G2B), a service for businesses. Reduction of administrative burden on businesses due to granting complex electronic services, exceptions of gathering of duplicating data and more effective utilization of information technologies. Lastly, Government to Nongovernmental organizations (G2N). It is an establishment of information and partner interactions between the governmental structures and the non-commercial organizations, with a view of information society and e-Government development.

2.2 Adoption process and challenges

According to Kotler and Keller (2006) adoption is an individual's decision to become a regular user of a product. Potential customers learn about new products by first trying them, and will either adopt or reject them. The consumer adoption process focuses on the mental process through which an individual passes from first hearing about an innovation to final adoption. Adopters of new products have been observed to move through five stages which are: 1) Awareness – the customer becomes aware of the innovation but lack

information about it, 2) Interest – the customer is stimulated to seek information about the innovation, 3) Evaluation – the customer considers whether to try the innovation, 4) Trial – the consumer tries the innovation to improve his or her estimate of its value and, 5) Adoption – the consumer decides to make full and regular use of the innovation

Some of the factors (Kotler & Keller, 2006) that influence adoption of an innovation can be summarized as; 1) Relative advantage. The degree to which the innovation appears superior to existing service. The adopters of e-Government would save time on travel and money; 2) Compatibility. The degree to which the innovation matches the values and experiences of the individual. Information on the governmental portals would be semantically rich; 3) Complexity. The degree to which the innovation is relatively difficult to understand or use. The portals design would not deviate from near life situations and would ensure ease of use; 4) Divisibility. The degree to which the innovation can be tried on a limited basis. Not all the information is provided in a single platform, but rather various departments control their data; and 5) Communicability. The degree to which the beneficial results of use are observable or describable to others.

Legality of online transactions has continued to retard the adoption of e-Government services. In this regard, the Kenya government realized the deficiencies in the Kenya Communications Act, 1998. In 2009, the act was amended paving way for e-Government services. Section 83G and 83H, which state in part, “Such documents, records or information are (rendered/retained) in electronic form if (a) the information contained therein remains accessible so as to be usable for subsequent reference” (IBM CSC, 2011).

Dada (2006) in a study in Kerala – India, identifies technology and the social contexts (people, culture, politics, etc) gaps in which such technologies are deployed. Where soft issues are not initially incorporated into the design of the e-Government project the result is an undesirable effect after implementation. Some of the factors are resources, skill-levels, values, beliefs and motivations. Codagnone (2008) identified; age, level of education, income, employment, ability, place of residence, Mindset, Social capital and other situational factors.

United Nations (2010) states that, “a misleading assumption frequently made with regard to public participation, be it ICT enabled or not, is that the simple creation of channels for citizens to interact with governments necessarily engenders citizen participation.”

2.2.1 Catalysts in the e-Government adoption

The growth of mobile telephony has increased the overall tele-density to 56.9 per cent. As at 1st quarter July-Sept 2010/2011, Communications Commission of Kenya (CCK) reported a mobile subscription of 22 million. Broadband subscriptions increased from 18,626 subscribers in the previous quarter to 84,726 representing 0.97 per cent of the total internet subscriptions in the country (CCK, 2011). Besides, a number of handsets available in the market are data enabled and is therefore able to access internet wherever there is signal. The increased tele-density which increases the geographic spread of internet and availability of data enabled handsets provide an opportunity for e-Government consumers to access services conveniently.

Broadband access and services. The growth of broadband access in developed regions and mobile cellular subscriptions in developing countries are trends that governments are reflecting in their use of ICT, to varying degrees (United Nations, 2010). In technical

terms, e-Government is an integrated tool comprising three enabling sets of new technology: infrastructure, solutions and the exploitation of public portals (Fang, 2002). Access channels which consist of online and offline channels or routes of distribution through which products, services and information are used, accessed, and communicated by multiple technologies (Ebrahim & Irani 2005). In this regard, mobile handsets are critical components in facilitating the growth of e-Government

Mobile Network Operators are increasingly turning on data services as the next frontier for revenue generation. Two operators, Safaricom and Telkom Kenya Orange are already offering 3G services in the country. According to Safaricom's financial reports for the year ending 2010, six hundred and seven out of 2,302 base stations are 3G (Safaricom, 2010). Another operator Airtel has also acquired the license and is currently running tests of 3G services. Expansion of broadband services is increasing with the recent announcement by a leading telecom provider Safaricom to be testing Long Term Evolution (LTE).

Tomaš Sabol et al (2011) reaffirm the need for semantic technologies when developing web portals. Users of electronic services expect as much as possible near life events. Taking life events (business episodes in case of businesses) as an expression of user's needs is in correspondence with the life event approach – an effective and frequently used method in the user-oriented e-Government solutions. A life event is a situation in the life of a citizen (in case of a business episode - in a life cycle of the business organisation), which requires provision of government services and should be semantically described within the system. Electronic services should have the capability to formally describe meaning and context of the services, both traditional ("paper-based" and face-to-face services) as well as electronic ones (provided as electronic forms or as web services),

without the necessity to modify the services themselves. In this way, users are able to relate what they are used to while accessing the manual services.

Growth in Cloud computing. Weinhardt et al (2009) describes cloud computing as the dynamic development, composition and deployment of software fragments. The predominant concepts include; Software as a Service (SaaS), and Platform as a Service (PaaS). The most favoured for e-Government deployment is SaaS. SaaS is a hosted deployment where the application is available to the end user on demand. The technical impact is that both the platform and infrastructure layers are opaque. In addition, the provider stores the data. The advantage of this service is that the customer requires little expertise to run the system. In this regard, design framework of the portals should consider web technologies that support cloud concepts. The large number of 22 million (CCK, 2010) mobile subscribers, provides an opportunity for Directorate of e-Government to deploy the services under SaaS framework.

2.3 Theoretical framework

The measurement of Information Systems (IS) success or effectiveness is critical to the understanding of value and efficacy of IS management actions and IS investments (DeLone & McLean, 2003). The framework adopted suggests that consumer satisfaction with e-Government services is an attitude that is influenced by beliefs about information quality, system quality and service quality.

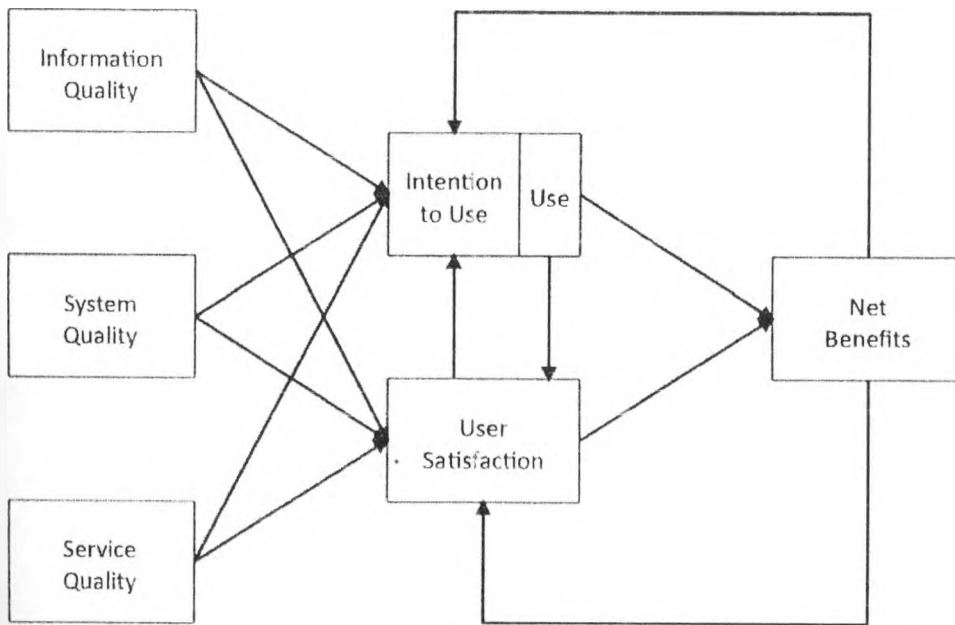


Figure 1: Information Systems Success Model

(Source; DeLone & McLean, 2003)

As illustrated in figure 1, the arrows demonstrate proposed associations between the success dimensions. The model can be interpreted as follows: A system can be evaluated in terms of information, system, and service qualities; these characteristics affect the subsequent use or intention to use and user satisfaction. Because of using the system, certain benefits would be achieved. The net benefits will influence (positively or negatively) user satisfaction and the further use of the information system (DeLone & McLean, 2003).

Information quality is measured in terms of accuracy, timeliness, completeness, relevance, and consistency. Szymanski and Hise (2000) information quality is a strong determinant of consumer satisfaction on online services (as cited by Cheung & Lee, 2005).

Table 1: Dimensions of Information Quality construct

Dimension	Explanation	Importance
Accuracy	The accuracy of information on the website.	The reliability of the information affects consumer evaluation of the website and transaction decision.
Content	The relevance and completeness of information on the website.	Providing relevant information can help dispelling concerns or fears about Internet shopping. Also, complete information will allow consumers to make competent and informed decisions about a product, service, or purchase
Format	The way the information is presented on the website.	The media richness of the Web facilitates the provision of graphics, text, sound, and video, making information attractive as well as useful.
Timeliness	The timelines of the information on the website.	If the website is not frequently updated, the information becomes outdated and therefore cannot deliver the expected performance.

Source: Cheung and Lee, 2005

System quality is measured in terms of ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, and importance. These are measures of both software and hardware metrics.

Recent research supports the use of semantics web services. A study by Tomáš Sabol et al (2011) confirms that semantics provides the capability to model and represent knowledge within a given domain by means of explicit formalisation of key domain concepts, their attributes and relations as well as workflow sequences and structures. Considering the heterogeneous and distributed nature of the e-Government domain, semantics can be effectively used as a common background platform for describing processes and services provided by governmental institutions on various levels. The common platform then enables to integrate the services, make them interoperable and transparent for end users (citizens and-or businesses).

Table 2: Dimensions of System Quality construct

Dimensions	Explanation	Importance
Navigation	The sequencing of pages, well organized layout, and consistency of navigation protocols	Keeping the navigation simple make it easy for consumers to find the product information and place an order.
Ease of Use	The extent to which the website is easy to use and helps consumers accomplish their tasks.	An easy to use website enhances consumer shopping experience.
Response Time	The speed of access and download information and the availability of the website at all times	The website needs to have consistently download speed. Consumers will abandon the transaction simply because of slow download.
Security	The website's ability in protecting consumer personal information collected from its electronic transactions from unauthorized use or disclosure.	Privacy and security of online transaction are important to build trust and long-term relationship.

Source; Cheung and Lee, 2005

Service quality instrument uses the dimensions of tangibles, reliability, responsiveness, assurance, and empathy. Information System – IS borrows this instrument from

marketing - SERVQUAL. As illustrated by DeLone and MacLean (2003), SERVQUAL instrument items include; 1) “IS has up-to-date hardware and software” (tangible); 2) “IS is dependable” (reliability); 3) “IS employees give prompt service to users” (responsiveness); 4) “IS employees have the knowledge to do their job well” (assurance); and 5) “IS has users’ best interests at heart” (empathy).

Table 3: Five Dimensions of SERVQUAL in the Online Context

Dimension	Explanation	Online Context
Tangibles	The physical environment, such as facilities, equipment, and appearance of personnel.	The appearance of the website: An appealing interface, ease of use, and understandability of the website interface, and the clarity of the purchase procedures are tangible service benefits
Reliability	The promised service in a reliable and dependable manner.	Providing the service on time and as ordered online.
Responsiveness	The willingness to help and prompt service.	Providing prompt service, helpful guidance when problems occur, and accurate information about the products or service.
Assurance	Knowledge and courtesy of service providers and their ability to provide trust and confidence.	Assurance that the online store is knowledgeable and courteous can be shown through the system’s ability to guide the customer through the process, and to apply additional beneficial services. In addition, courteous help-screens, and appropriate error messages and guidance boxes, among other means, can help customers in a manner comparable to guidance signs and instructions in a regular store
Empathy	The care and individualized attention	Creating a personalized service through customized contents, personal greetings, and individualized e-mail.

Source; Cheung and Lee, 2005

Customer satisfaction which is the extent to which an application helps the user creates value for the firm’s internal or external customers. DeLone and McLean (2003), raises the issue of concern regarding benefits for whom – the designer, the sponsor or the user?

In this analysis, the benefits are attributed to the user who is the consumer of e-Government services. By adopting e-Government services, users expect to obtain reliable and relevant information in a simple and easy to use environment. While doing this, the user expects that the provider ensure security of personal information.

A number of G2C studies is based on the theoretical frameworks derived from Rogers' diffusion of innovation (DOI) theory; Fishbein and Ajzen's (1975) theory of Reasoned action (TRA); Ajzen's (1985) theory of planned behavior (TPB), Davis' (1989) technology acceptance model (TAM) (Carter and Belanger 2005; Dimitrova and Chen 2006; Gilbert et al. 2004; Horst et al. 2007) as cited in (London School of Economics and Political Science, n.d.). Figure 2 illustrates Technology Acceptance Model – TAM

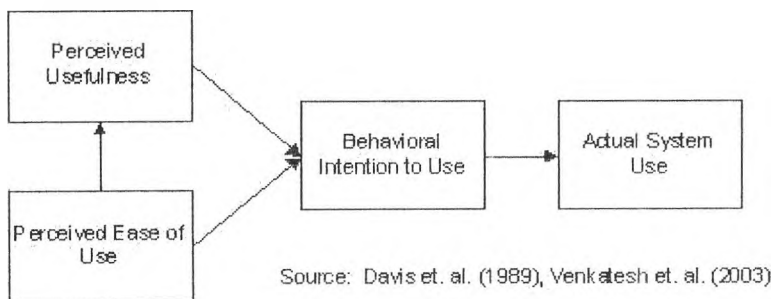


Figure 2: Technology Acceptance Model

TAM posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use. Where Perceived usefulness is the "degree to which a person believes that using a particular system would enhance his or her job performance" (York University, 2010). Perceived ease-of-use as "the degree to which a person believes that using a particular system would be free from effort"

Individuals are seen as possessing different degrees of willingness to adopt innovations and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time Rogers, (1995) as cited in (Robinson, 2009).

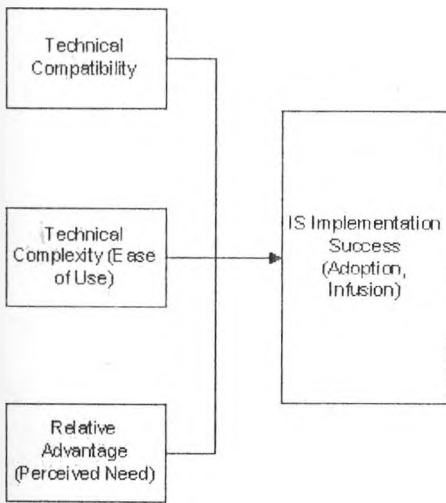


Figure 3: Diffusion of Innovation Theory

Source: Rogers (1995)

Figure 3 illustrates Diffusion of Innovation Theory. These two models (TAM and DOI) overlook the quality constructs of Information, System and Service. The quality constructs help public sector Information System practitioners interrogate the system while it is under development all the way to adoption. TAM constructs are in a way feeding from the net benefits derived from Information Systems Success Model.

2.4 Evaluation

According to United Nations (2010), the value of e-Government will increasingly be defined by its contribution to development for all. Citizen-centricity, inclusiveness, connected government, universal access and use of new technologies such as mobile devices are the benchmarks against which electronic and other innovative forms of public service delivery are assessed.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research design

The research design for this study was a survey. The advantages of a survey are that it can complete structured questions with many stakeholders within a relatively short time frame. It is quantifiable and generalizable to an entire population if the population is sampled appropriately (University of Toronto, 1999). Using a survey research method is considered to be an appropriate research approach to address the citizens' awareness and adoption of technology services (Choudrie & Dwivedi, 2005)

3.2 Population and sampling

The universe of the study comprises regular students from the public universities within Nairobi metropolitan. This is informed by the unique requirements of these students particularly access to higher education loans scheme extended to them. In addition, public universities have been developing portals integrating student management systems as part of e-Government. A number of researchers have used students to test technology adoption (Wahid, 2007; EDUCAUSE, 2010). The selection of the universities is based on the information on the Commission of Higher Education website that shows the list of public universities. The distribution of the universities and the proposed respondents is in Table 4.

Table 4: List of selected universities

	Institution	No. of Students
1	University of Nairobi	50
2	Kenyatta University	50
3	Jomo Kenya University of Agriculture	40
4	Multi Media University College	10
		150

The researcher targets fifty students in each university. To ensure equal representation, sampling was judgmental. Interviews were conducted at public places at the universities for example; photocopy areas, cafeterias, parking lots, and lawns.

3.4 Data collection

Primary data was collected using structured questionnaires through face to face interviews. The questionnaire was divided into 4 sections as attached in the appendix. Section A captured the demographic factors, Section B – factors influencing consumers in adoption process and Section C – value that the consumers derive from usage. Section B and C of the questionnaire has a 5-point Likert scale ranking questions (1= not at all; 5=very large extent and 1=strongly disagree; 5=strongly agree). Likert scales measure attitude and have been used to measure student views on various educational interventions (Jamieson, 2004).

3.5 Data Analysis

The data collected was checked for completeness and subjected to cleaning. Descriptive analysis was used to summarize the data output. For Section A, frequency tables were used to show the dynamics of the population. Likert scores in Section B and C were analysed by use of frequency tables, mean and standard deviation for the attributes of information, system and service qualities. Graphical analysis was done to improve the presentation of the analyzed results for ease of interpretation and understanding.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter discussed the findings of the research in relation to investigating the extent to which e-Government has been adopted by students in public universities in the Nairobi metropolitan. In order to attain these objectives, a survey study was conducted. The research instrument was a questionnaire administered by the researcher through a face to face interview. The response rate was 93.3% which was considered high in line with Ammentorp et al, (2007) who observed that a response rate of 50% is generally accepted while response rates of 50–60% even considered as ‘quite high’ while analysing quality.

4.2 Demographic indicators

As illustrated in table 5, on the area of residence, 33.6 percent were from the rural areas while 66.4 percent were from the urban areas. There was no significant influence of adoption based on the where the respondents lived. All the respondents had used internet and e-Government services.

Table 5: Area of residence

	Frequency	Percent
Rural	47	33.6
Urban	93	66.4
Total	140	100

Regarding gender, Table 6 illustrate that 28.6 percent of the respondents were female while 71.4 percent were male. All the respondents had used internet and by extension e-Government services.

Table 6: Gender

Gender	Frequency	Percent
Female	40	28.6
Male	100	71.4
Total	140	100

As illustrated in Table 7, a number of respondents fell in the 22-24 age brackets constituting 46.4% for the undergraduates and over 25 years for the postgraduate students, 12.9%. Undergraduates accessed the internet predominantly using the mobile phone, 34.3% and a cyber 4.3%. For the postgraduate students, the means of access to internet was through personal computers, 21.4% at either in the office 5 percent and 0.7% at home.

Table 7: Age rages

Age rage	Frequency	Percent
18-19	11	7.9
20-21	44	31.4
22-24	65	46.4
over 25	18	12.9
Total	140	100

Table 8 illustrates the year of study at the university. The study captured more of second and fifth (23.6%) year students to evaluate adoption dynamics. Second year students have used the student management system for the entire period they have been at the campus while the fifth year students used both the manual and online services. For postgraduate students, a number were working and their both tools of access and location were different.

Table 8: Year of study at university

Year	Frequency	Percent
First	23	16.4
Second	33	23.6
Third	19	13.6
Fourth	24	17.1
Fifth	33	23.6
Postgraduate	8	5.7
Total	140	100

As illustrated in Figure 4, campus is pivotal location in the student's access to e-Government services. Respondents (120) who were undergraduate reported that they access internet services at campus, 28 at home and 11 at the office. Postgraduate students access internet either at home or in the offices. The high number (120) of students who access internet at the campus leads to a pointer that a provider of e-Government services needs to create a linkage with the students. This can be on testing of new technologies, where students have shown a higher adoption rate Birman, (2005) and Wahid, (2007) considering early exposure to technology and influence of other student.

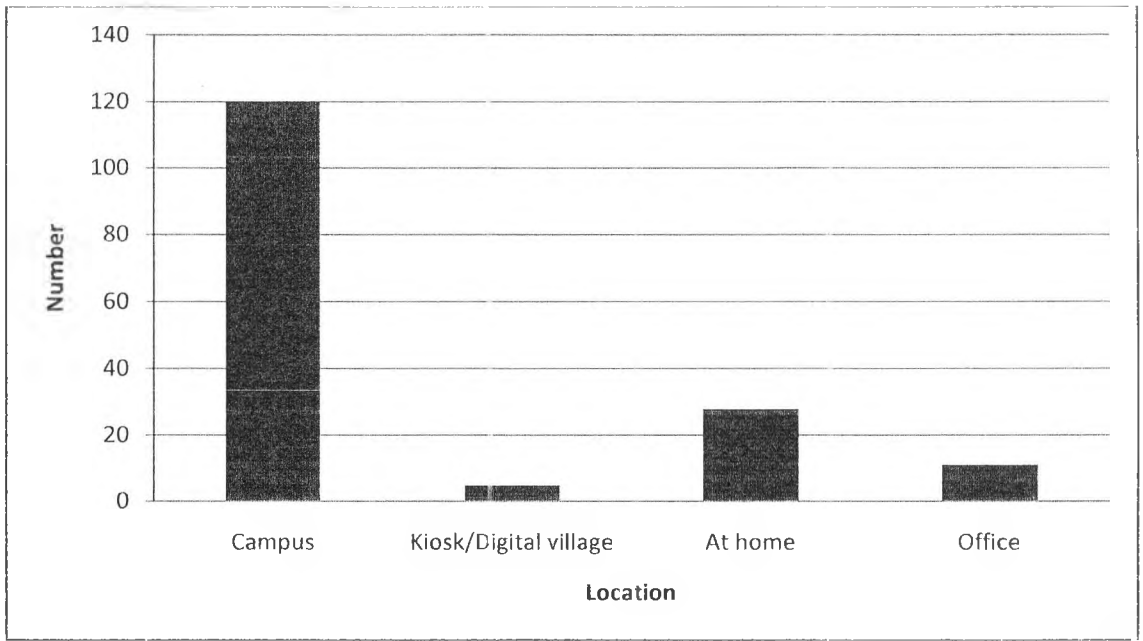


Figure 4: Location of Access

The role of mobile telephony as a means of internet and by extension access to e-Government services is rising. Respondents who use mobile alone to access internet were 34.3 percent. However, 97 respondents (69%) indicated that they use mobile phone for internet access. Considering this, suppliers of e-Government services need to include mobile applications in their design structures.

Figure 5 illustrates that access by mobile telephony 51% which is higher than the personal computer at 46%. It is worth noting that there are some respondents who are already using digital television as a means of access, (3%).

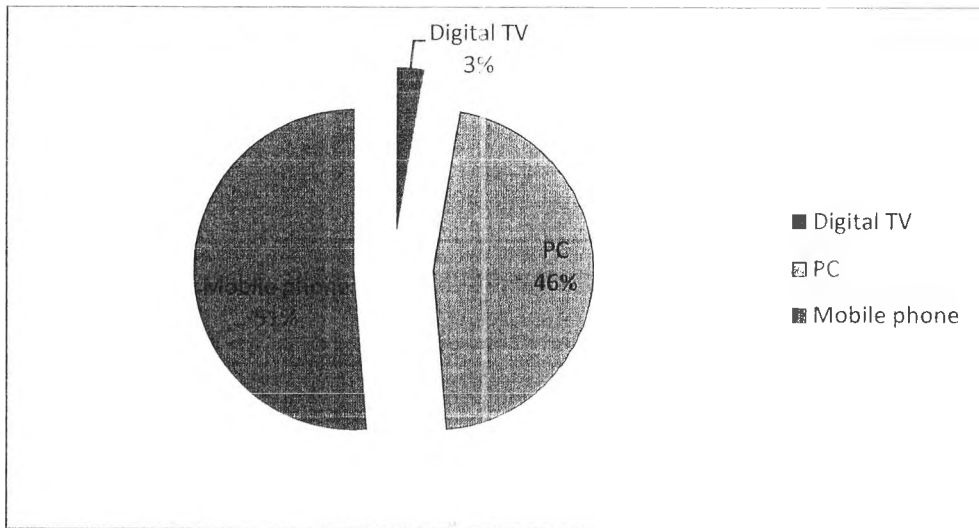


Figure 5: Means of Access

4.2 Information Quality

Information quality is measured in terms of accuracy, relevance and completeness of content. Table 9 illustrates the information quality dimensions. The weighted mean is 3.4. Therefore, respondents rated that the service as unreliable (3.1). The reliability of the information affects user evaluation of the portal and transaction decision. Providing relevant information can help dispel fears about e-government (Cheung & Lee, 2005).

Complete information allows users to make competent and informed decisions about a service. Completeness and acceptability of the portals requires multifaceted skills. It is important to identify skill requirements of various agencies and how these skills can be assembled to work together in the development process. Respondents reported that the information was incomplete (3.1) does not meet expectations (3.2) of a portal. If the website is not frequently updated, the information becomes outdated and therefore cannot deliver the expected performance (Cheung & Lee, 2005). Respondents reported that the

information was out of date service (3.3). However, respondents reported that the information was useful (3.7), relevant (3.4) and communicable to another person (3.7)

The content of the portals reflects a general view that portals are for marketing of the respective institution. As currently designed, more information is provided regarding management activities and not transactions that the users are interested in. This confirms the belief that a number of the portals contain information that is irrelevant.

Table 9: Information quality dimensions

Information Quality	N	Mean
Reliability of the information	140	3.1
Relevance of information	140	3.4
Completeness of the information	140	3.1
The way the information is presented on the website (Richness)	133	3.5
Attractiveness of the portal	140	3.5
Usefulness of the portal	132	3.7
Timeliness of the information on the portal	140	3.3
Communicable information on the portal	140	3.7
Mean		3.4

Information presentation on the portal. The media richness of the portal facilitates the provision of graphics, text, sound, and video making information attractive as well as useful (Cheung & Lee, 2005). Regarding richness of the information provided on the web-portal, respondents reported that the information was rich (3.5)

A number of the portals display information that is not relevant for transaction purposes. Figure 8 is an illustration of HELB portal, the home page is brochure based providing information about the institution.

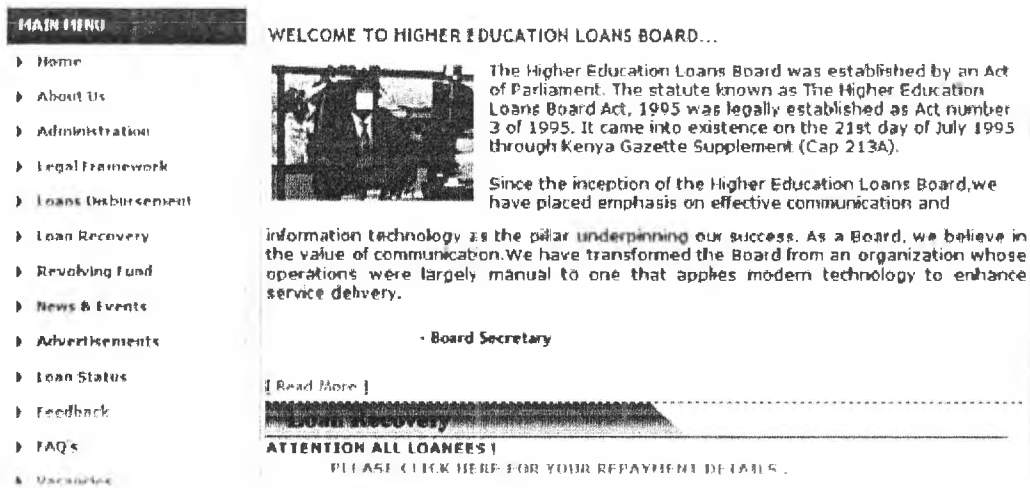


Figure 6: Higher Education Loans portal

In the case of a portal dealing with student loan scheme, more information about the loan facilities is expected. The portal can aggregate loan facilities from other agencies and the private sector.

4.3 System Quality

System quality measures ease-of-use, functionality, response time and security features. Table 10 illustrates the dimension of system quality. The weighted mean is 3.4. Navigable pages make it easy for users to locate service information. Respondents rate navigation (3.7) to be good. A portal that is easy to use enhances the user experience while consuming government services. Respondents rate ease of use (3.7) to be good. Also, ease of locating information on the portal (3.6) and they were able to accomplish tasks quickly (3.5). A good portal need to be available all the time as well as keep a consistent download speed, respondents rate availability at (3.1) and the speed of access and download at (3.1). It means that these factors are poor. As noted by Cheung and Lee (2005), consumers will abandon a transaction simply because of a slow download speed. Further studies needs to be conducted to technically evaluate the portals in the areas of information processing and grounding technologies as proposed by Lara Reuben et al

(n.d.). Respondents rated download speed as poor against a backdrop of availability of submarine optic cables and the national terrestrial cables.

Table 10: System quality dimensions

System Quality	N	Mean
The extent to which the portal is easy to use - Ease of use	135	3.7
Sequencing of pages and consistency of navigation tools – Navigation	134	3.7
Easy to locate information	140	3.6
Help consumers accomplish task quickly	136	3.5
Availability of the portal	132	3.1
Speed of access and download information - Speed of access	133	3.1
Ability of the portal to protect personal information – Trust	135	3.4
Mean		3.4

Privacy and security of online transactions are important to build trust and long-term relationships. Respondents reported that the portal could be trusted (3.4). Research on citizen’s perspective of e-government service identifies security of personal information as a major inhibitor of adoption (Arslan, 2009). An evaluation of the HELB portal and University of Nairobi student management system reveal that security authentication is through national identification card number and a combination of student registration number and ID number respectively. This measure is not sufficient. Respondents reported concerns (51.1%) on the security procedures used to access private information. Figure 7 is an illustration of HELB login screen.

Login Screen	
Student Category	-- Select an option -- ▾
Enter National ID: Number	<input type="text"/>
<input type="button" value="Login"/>	

Loan Repayment Information

We bring to your attention that your loan repayment can be made through any of the following HELB bank accounts:

Figure 7: Student login screen – HELB

Figure 8 illustrates student login screen for the University of Nairobi student management system. The password authentication is through national identification card, passport or Kenya Certificate of Secondary Education (KCSE) index number.

Portal Home	Fee statement	Timetables	Course Registration	Results	Enquiries	Book Room
Change Password	Student ID	Inter Faculty Transfer				

SMIS Login

Registered Online Users

Log on using the Registration Number. *The year of registration must be in full eg .../2009*

Registration Number: *Type your Student Registration Number*

Password: *Use your National ID / Passport No. or KCSE Index No. or Registered Mobile No. as your initial password*

Figure 8: Student login screen - University of Nairobi

In response to the questions, students were compared the manual system and the digital one. A number of students interviewed had gone through the manual system of registration and using the portal.

4.4 Service Quality

Service quality instrument measures the dimensions of tangibles, reliability, responsiveness, assurance and empathy. Table 11 illustrate the dimensions of service

quality. The weighted mean is 3.3. Tangibles in an online service are superiority of service, appealing interface and clarity of procedures. Respondents rated the service as superior (3.7) and clarity in transaction procedures (3.5). However, the interface was rated as poor (3.0). Reliability and dependability are measures of on time service provision and as ordered. Respondents rated dependability as poor (3.1). To illustrate responsiveness of an online service, helpful guidance when problems occur and accurate information (3.1) are factors to consider. Respondents rated the service as prompt (3.4).

Table 11: Dimensions of service quality

Service Quality	N	Mean
Superior service	136	3.7
An appealing Interface	134	3.0
Clarity of transaction procedures	130	3.5
Promised service is dependable	131	3.1
Providing prompt service	134	3.4
Courteous	135	3.4
Appropriate error messages	137	3.2
Individualised service through customised service	136	3.3
Mean		3.3

Assurance that e-Government provider is knowledgeable and courteous is shown through the system's ability to guide the customer through the process (Cheung & Lee, 2005). Respondents rated courtesy as good (3.4). In an online service, it is the system interacting with the users who need to feel a near life situation in the interaction. Therefore, appropriate error messages help users in a manner comparable to guidance signs and instructions. Respondents rated poor the appropriate error messages (3.2).

To show empathy in the service is by creating a personalized service through customized contents, personal greetings and individualized emails (Cheng & Lee, 2005). Respondents rated individualised service as good (3.3)

4.5 Service Benefits

This research attributes benefits to the user. It defines user's satisfaction as the extent to which an application helps the user create value from the service. Students are now able to make transactions from anywhere without necessarily being at the university. Before the introduction of the student management system, room bookings and other registrations would take at least three days for the school of engineering students who are fewer compared to other schools. Now, bookings and other registrations take between 20 minutes to 6 hours to complete. It therefore confirms that students benefit from a faster processing speed while using online services.

Table 12 illustrates the rating of the benefits of the e-Government. The weighted mean of the benefits is 3.3. The advantage of having a portal is to digitally link all the data into one common place. On comprehensiveness of the portal, that is, providing required government data, respondents reported that not all government information was available online (2.9), there was no quick response from the provider when queries were submitted (3.0), and the service is not personalised (3.3). A personalised service would avail customised content through greetings and individualised email. However, respondents reported that service is convenient (3.8), there is linkage with other services (3.3), it is accessible (3.7), it saves time on travel (4.1), the processing speed is good (3.8) and they felt that the service enhanced their personal safety (3.7).

Table 12: Benefits of e-Government

E-Government benefits	N	Mean
Access to e-Government is convenient	140	3.8
All the information is provided (comprehensive service)	140	2.9
Linkage with other services	140	3.3
Information is easily accessible on the site	140	3.7
Receive a quick response after submitting queries	140	3.0
Travel time saving while using the online services	140	4.1
Faster processing speed while using the online service	140	3.8
Enhanced personal safety	140	3.6
Mean		3.5

They did not have experience of a fully integrated system and were guided by a comparison between the manual system and electronic system. Students fill online forms and they wait for feedback from the staff. The benefit on the service is that the response time is quicker. Quick response from staff was poor (3.0). The risk exposure is more when one has to travel. E-government service provides an opportunity to conduct transactions without having to travel. This can be done at home, office or in college rooms. Respondents rated personal safety as good (3.6)

This research confirms the proposition that deployment and effective adoption of e-government services saves on travel time, a quicker processing speed and enhancement of personal safety.

4.6 Discussions

The following conclusions can be drawn from the study. The updated DeLone and McLean (2003) model was confirmed as a useful tool to isolate factors that influence the adoption of e-Government services. This confirms also, other studies done by Jang (2010). However, in cases where the service is compared to a manual system, a number of quality issues are ignored by the consumer. An example is timeliness as a means of measuring information quality can vary. Where in a manual system registration took three days, online service took between 20 minutes to 6 hours. This huge time variation is still acceptable to the users.

The design and implementation involves not just technology but other soft issues more so intended user engagement at an early stage to identify what they require and in what format. When this is done, multifaceted skills resident in the different agencies can be tapped. In this way, the information would be complete and relevant. It is interesting to note that even though the country has fibre optic submarine cables and terrestrial optic cables; the speed of access is still low. It points to the design challenges of the portals. Lastly, dependability of a system is crucial for its adoption. In this study dependability is identified as one of the key weaknesses of the systems.

Respondents reported favourably on a number of dimensions, however, discussions with them illustrated that they were comparing the dimensions with a manual system. The services are still new and are compelled to use them as provided. For example, before the adoption of e-government, students travelled to HELB offices to obtain loan forms, but now, they download the forms print and submit. While it was taking three days to

complete a registration process, now it takes a few hours, therefore an outage of a few hours seems acceptable to the users.

The government needs to set priorities and shift these priorities based on progress determined by levels of adoption. The current priority areas are to secure the systems, make them dependable so that users can have comfort that a system is available for use all the time. At the same time, a recognition that design and information gathering is multifaceted therefore not being a preserve of the IT department but rather for all departments. In this way, information will be complete provided in a manner that is accessible to the users.

Trust will be achieved when the government implement good credentials for authentication. One of which is the Public Key Infrastructure (PKI). PKI enables users of a basically unsecure public network such as the Internet to securely and privately exchange data and money through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority. It is a set of procedures and technology that provides security and confidentiality for electronic business (Techtarget, 2011; Government of Australia, 2011). Currently, there are no standards on security making developers to select weak methods of authentication such as national identity card numbers. In a case where PKI is implemented, users have one access key for all transactions.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of findings, conclusions made and recommendations for further research. This study began with a view that deployment of e-Government is beneficial to citizens which formed the basis for the selection of students. A review of past research efforts was also explored as a preamble to identify the existing research gap. The study had two objectives, namely to determine the factors that influence the consumers in the adoption of e-Government services and to evaluate the benefits that consumers derive from e-Government services. To achieve this, a survey study was conducted using a questionnaire.

5.2 Summary of Findings

In the past, efforts have concentrated on the supply side that is in the areas of policy, technical issues, strategies, regulations, and deployment. As a result, demand side was identified as having been ignored by previous efforts. The first objective of the research was to determine the factors that influence the consumers in the adoption of e-Government services. The findings indicate that on the information quality construct; reliability, completeness and timeliness of the information are fundamental factors that inhibit the adoption. Secondly, on system quality; availability of the portal and speed of access and download are the major inhibitors. Third, on service quality; appealing

interface (design) undependability and lack of courtesy are the major impediments to adoption.

The benefits are impeded by the lack of a comprehensive service and linkage with other services. Integrated shared information improves the consistency, quality and timeliness of response to external requests for information. Currently, institutions that have deployed portals have no requisite linkages with similar institutions. In essence more and more portals are information silos. Consumers still make trips to respective offices even after submitting online requests for services

Consumers however, concur that access to e-Government is convenient, government information is easily accessible online and it is a big saving on their travel time. The processing speed is much faster while using online services and the personal safety is enhanced due to risk exposure associated with travelling.

5.3 Overall Conclusion

The main lessons learnt is that adoption of e-Government services is gaining acceptance amongst students, a phenomenon that can be replicated to other users. In terms of technology adoption, students provide a good environment for technology testing. During the study, all the students interviewed had used internet which is the backbone of e-Government deployment. The findings reveal students are able to overcome issues such as security of personal information. They can therefore form part of early adopters as propounded by Rogers's diffusion of innovation theory.

Information systems success model has been used mainly in evaluating e-commerce systems. However, the finding of his research reaffirms the holistic nature of the constructs more so in identifying factors that affect adoption and their level of sensitivities. All the dimensions of the constructs influence adoption of e-government services.

The increasing importance of mobile phones as an access tool. The findings reveal that all the students had at least a mobile phone, out of which 34.3% of the respondents access the internet using the mobile phone against 21.4% who use personal computers. While the trend is mobile access, the design of a number of portals was not compatible with mobile technologies.

5.4 Limitations of the study

The study was limited to public universities within Nairobi metropolitan due to cost constraints of alternative designs. Due to the newness of the service, the consumer's purview is still limited therefore they are not able to rightly gauge a good online service.

5.5 Recommendations

The study concurs with Jang (2010) and recommends that public agencies provide the e-Government users with better on-line services regarding the man-machine interaction and operation assistance in end-user computing environments. Since it is a man-machine interaction, adoption will be influenced by how best the portal interacts with its intended users and how best the service is dependable.

In order to improve the security of the system to forestall any future legal ramifications, the study recommends that the government urgently provide consistent and comprehensive e-authentication measures across government agencies. Authentication increase trust levels of the users. The current authentication through national identity card numbers or passport numbers exposes the system to cyber security risks. When all these are done, it will enhance the confidence in electronic dealings with government agencies.

5.6 Areas for further research

This study analysed adoption dynamics within G2C classification and in particular students. It however, provided a basis for further work in evaluating adoption factors affecting other users of e-Government services. It was therefore recommended that:

- a) Further studies that evaluate adoption characteristics of other users in the G2C classification
- b) Further studies on the perception of businesses as both consumers and developers of the service.
- c) Further studies on government departments as consumers and suppliers of the service.

REFERENCES

Al-Jaghoub, S., Al-Yaseen, H., & Al-Hourani, M. (2010) "Evaluation of Awareness and Acceptability of Using e- Government Services in Developing Countries: the Case of Jordan" *The Electronic Journal Information Systems Evaluation Volume 13 Issue 1* 2010, (pp1 - 8). Retrieved 9 January, 2011, from EJISE database.

Ammentorp, J. Rasmussen, A. M., Nørgaard, B. Kirketerp, E. & Kofoed, P. (2007). Electronic Questionnaires for Measuring Parent Satisfaction and as a Basis for Quality Improvement. *International Journal for Quality in Health Care; Volume 19, Number 2:* pp. 120–124

Arslan, A. (2009). *Cross-Cultural Analysis of European e-Government Adoption*. Naval Training Centre. Retrieved 20, March 2011 from http://mpra.ub.uni-muenchen.de/20705/1/MPRA_paper_20705.pdf

Birman, L. B. (2005). *User Competence and Influence on the Adoption of New Technologies: Technophobia, Exposure to Technical Jargon, and the Support of Social Networks*. Unpublished Master's, San Diego State University, San Diego State University.

Bwalya, K. J. (2009). Factors Affecting Adoption of E-Government in Zambia. *The Electronic Journal on Information Systems in Developing Countries*. Vol 4, 1-13. Retrieved 12, February, 2011, from EJISDC database.

CCK, (2010). *Quarterly Sector Statistics Report*. Retrieved 10, March, 2011 from www.cck.go.ke

Cheung, C.M.K. & Lee, M.K.O. (2005) "Research Framework for Consumer Satisfaction with Internet Shopping," *Sprouts: Working Papers on Information Systems*, 5(26). Retrieved 20 January, 2011 from <http://sprouts.aisnet.org/5-26>

Choudrie & Dwivedi (2005). A Survey of Citizens' Awareness and Adoption of E-Government Initiatives, the 'Government Gateway': A United Kingdom Perspective. *Egovernment Workshop '05 (Egov05), September 13 2005*, West London UB8 3PH, UK: Brunel University

Codagnone, C. (2009). Future technology needs for future eGovernment Services. Needs and Trends Analysis. European Commission, DG INFSO ICT for Government and Public Services

Dada, D. (2006). The failure of e-government service in developing countries: A literature review. Department of Information Systems. London School of Economics. *The electronic journal of Information Systems in Developing Countries* 26 1 1-10. Retrieved 13 March, 2011, from EJISDC database

DeLone, W., H. & McLean, E. R. (2003). The DeLone and McLean Model of Information systems success: A Ten-Year Update. *Journal of Information Systems*, Spring, Vol 19, pp.9-30

Ebrahim, Z., & Irani, Z. (2005). E-government adoption: architecture and barriers. *Business Process Management Journal Vol. 11 No. 5*, pp 589-611. Emerald Group Publishing Limited.

EDUCAUSE. (2010). *Technology Adoption and Ownership of Information Technology. Students and Information Technology 2010*. Retrieved 10 February, 2011 from net.educause.edu/ir/library/pdf/ERS1006/RS/ERS1006W.pdf

Fang, Z. (2002). E-Government in Digital Era: Concept, Practice, and Development. *International Journal of the Computer, The Internet and Management, Vol. 10*, p 1-22.

Government of Australia (2011). *Medicare. Department of Human Services*. Retrieved 2 August, 2011 from <http://www.medicareaustralia.gov.au/provider/vendors/pki/index.jsp#N10048>

Jamieson, S. (2004). *Likert scales: how to (ab)use them*. Blackwell Publishing Ltd Medical Education 2004. Retrieved 2 August, 2011, from <http://gate.ac.uk/sale/dd/statistics/1LikertScales.pdf>

Janowski, T. (n.d.). *Introduction to Electronic Government*. Centre for Electronic Governance. International Institute for Software Technology. United Nations University. Macau. Retrieved 15 March, 2011 from <http://www.emacao.gov.mo/documents/14/01/seminar1.pdf>

Jennex, M., & Olfman, L. (2003). "A Knowledge Management Success Model. *An Extension of DeLone and McLean's IS Success Model*," *Proceedings of the 9th Americas Conference on Information Systems*. Tampa, Florida: AMCIS

Kamar & Ongondo (2007). Impact of e-Government on Management and use of Government Information in Kenya. *World Library and Information congress: 73rd IFLA general conference and council of 19-23 August 2007*. Durban, South Africa: IFLA

Kenya National Bureau of Statistics. (2010). *Economic Survey*. Nairobi: Ministry of Planning and Vision 2030, Kenya

Kotler, P., & Keller, K. (2006). *Marketing Management* (12th Ed.). Upper Saddle River, New Jersey, USA: Prentice Hall.

Lara, R. Han, S. K. Lausen, H. Stollberg, M. Ding & Y. Fensel D (n.d.). *An Evaluation of Semantic Web Portals*. Digital Enterprise Research Institute, Universität Innsbruck: Austria

Laudon, K., & Laudon, J. P. (2006). *Management Information Systems: Managing the Digital Firm* (10th Ed.). Prentice Hall: Upper Saddle River, New Jersey, USA.

London School of Economics and Political Science (n.d.). *Factors Influencing Citizen Adoption of E-government: A Review and Critical Assessment*. Retrieved 20 March, 2011, from [Http://Is2.Lse.Ac.Uk/Asp/Aspecis/20080090.Pdf](http://Is2.Lse.Ac.Uk/Asp/Aspecis/20080090.Pdf)

Matavire, R., et al (2010). Challenges of e-Government Project Implementation in a South African Context. *The Electronic Journal Information Systems Evaluation Volume 13 Issue 2 2010*, (pp153 - 164). Retrieved 10 March, 2011, from EJISE database.

Molla, A. & Licker, P. S. (2001). E-Commerce Systems Success: An Attempt to Extend and Respecify the Delone and Maclean Model of Is Success. *Journal of Electronic Commerce Research*, Vol. 2, No. 4.

Ndou, V. (2004). E – Government for Developing Countries: Opportunities and Challenges. *Electronic Journal of Information Systems in Developing Countries 18, 1*, 1-24. Retrieved 13 March, 2011, from EJISDC database.

Neemesh, K., et al (2011). Development of a Legal and Regulatory Framework for e-government in Kenya. *A presentation to the Directorate of E-government by the IBM Corporate Service Corps in July 2011*. Nairobi: Directorate of E-Government

Ochara, N. M. (2008). Emergence of E-Government Artefact in Kenya. *The African Journal of Information Systems, Volume 1, Issue 1, 2008*. Retrieved 6 March, 2011 from www.ejise.com/issue/download.html?iaArticle=673

Ochara, N. M., & Van Belle J.P. (2008). Managing the E-Government Adoption Process in Kenya's Local Authorities. *Communications of the IBIMA Volume 1, 2008*. Retrieved 18 December, 2010, from IBIMA Publishing database

OECD, (2009). *Towards Green ICT Strategies: Assessing Policies and Programmes on ICT and the Environment*. Retrieved 10 March, 2011, from <http://www.oecd.org/dataoecd/47/12/42825130.pdf>

Rickard, K. (2007). *E-Mentoring and Information Systems Effectiveness Models: a useful nexus for evaluation in the small business context*. Unpublished Doctoral dissertation, Victoria University Victoria, Australia

Robinson, L. (2009). *A summary of Diffusion of Innovations*. Retrieved 11 February, 2011, from www.enablingchange.com.au

Satyanarayana, J. (n.d.). *Challenges of e-Government ... two success stories from India*. IT & Communications Department. Andhra Pradesh, India. Retrieved 20 March, 2011, from <http://unpan1.un.org/intrdoc/groups/public/documents/apcity/unpan003379.pdf>

Schuppan, T. (2008). E-Government in developing countries: Experiences from sub-Saharan Africa. *Government Information Quarterly*, 26, 118–127. Retrieved 20 March, 2010, from Elsevier Inc. database

Siemens, AG. (2008). *Siemens IT Solutions and Services*. Retrieved 20 March, 2011, from www.siemens.com/it-solutions

Tania, G., Devindra, R., & Wilkins, J. (2006). Introducing a New e-Governance Framework in the Commonwealth: From Theory to Practice. Adjudicated Papers of 21-25 October 2006 CAPAM Biennial Conference. Sydney: Australia

Techtarget (2011). *Public Key Infrastructure* Retrieved August 3, 2011, from <http://searchsecurity.techtarget.com/definition/PKI>

Tomáš, S., Ján, H., Peter, B., & Karol, F. (2011). Integration of Government Services using Semantic Technologies. *Journal of Theoretical and Applied Electronic Commerce Research* Vol 6 / Issue 1 / April 2011 / 143-154

United Nations (2010). *United Nations e-Government Survey 2010. Leveraging e-Government at a time of financial and economic crisis*. Retrieved February 20, 2011, from http://www2.unpan.org/egovkb/documents/2010/E_Gov_2010_Complete.pdf

University of Toronto (1999). *Conducting Survey Research. The Health Communication Unit*. Retrieved March 20, 2011, from http://www.esf-agentschap.be/uploadedFiles/Voor_ESF_promotoren/Zelfevaluatie_ESF-project/niet%20experimenteel%20onderzoek.pdf

University of York (2010). *Theories used in Information Systems Research*. Retrieved April 12, 2010, from http://www.fsc.yorku.ca/york/istheory/wiki/index.php/Main_Page

Wahid, F. (2007). Using the Technology Adoption Model to Analyse Internet Adoption and Use among Men and Women in Indonesia. Department of Informatics. Faculty of Industrial Engineering. Islamic University of Indonesia, Yogyakarta, Indonesia.

Weinhardt, C., Anandasivam, A., Blau, B., & Stößer, J. (2009). Business Models in the Service World: In Proceedings of IT Professional (pp. 28-33). Germany: Universität Karlsruhe (TH).

APPENDICES

Appendix 1: Questionnaire

Section A: Demographics and other general information

Please answer the following questions in respect to your use of the internet for your studies by placing a tick in the space provided or give details as may be necessary.

1. In which area do you live?

Rural

Urban

2. In which year are you? (duration since admission)

First

Second

Third

Fourth

Fifth

Sixth

Postgraduate

3. What is your gender?

Male

Female

4. What is your age?

18 – 19

20 – 21

22 – 24

Over 25

5. Where do you access Internet? You may tick more than one box

Location	Please tick more than one
University	<input type="checkbox"/>
Kiosk/Digital village	<input type="checkbox"/>
At home	<input type="checkbox"/>
Office	<input type="checkbox"/>
Other, please specify	<input type="checkbox"/>

6. What means do use to access internet?

Means	Please tick
Digital TV	
PC	
Mobile phone	
Other, please specify	

Section B: Factors affecting the adoption of e-Government services

The following are factors that affect adoption of e-Government services. Please tick in the appropriate boxes to indicate the extent to which each influenced your adoption of e-Government services in your studies.

Verbal Interpretation	Abbreviation	Scale
Very large extent	VLE	5
Large extent	LE	4
Moderate	M	3
Small extent	SE	2
Not at all	NA	1

	Very Large Extent	Large Extent	Moderate	Small Extent	Not at all
	5	4	3	2	1
Information Quality					
The information on the website is accurate					
The content on the portal is relevant					
The content on the portal is complete					
The information on the portal is attractive					
The information on the portal website is rich; graphics, text, sound					
The information on the portal is useful					
Content of the relevant portal website meet my expectations of an e-Government portal					
Up-to-date information on the web portal					
Service can be effectively communicated					

to another person					
System Quality					
System is easy to use					
Navigation between pages is simple					
It was easy to locate information					
Was able to accomplish tasks quickly					
The download speed was good					
The portal was available all the times					
There was a trust that personal information collected is protected					
Service Quality					
Service is superior to existing services					
Service matches my values and experiences					
Appealing interface					
Clarity of payment procedures if any					
Promised service is dependable					
Providing prompt service					
The service was provided as promised					
Courteous service with help screens and guidance boxes					
Appropriate error messages					
A feel of a individualized service					
Other, please specify					

Section C: The expected benefits of e-Government adoption

The following are statements in respect of benefits in adopting e-Government services. Please tick in the appropriate boxes to indicate the degree to which you agree with them as they apply to the benefits you may have experienced in the use of e-Government services in your studies.

Verbal Interpretation	Abbreviation	Scale
Strongly Agree	SA	5
Agree	A	4
Neither Agree	NA	3
Disagree	DA	2
Strongly Disagree	SD	1

	Strongly Agree	Agree	Neither Agree	Disagree	Strongly Disagree
	5	4	3	2	1
Access to e-government service is convenient					
All the government information is provided online					
Linkage with other services					
Information is easily accessible on the site					
Receive a quick response from staff after submitting queries					
Travel time saving while using the online services					
Faster processing speed while using the online services					
Personalized service					
Enhanced personal safety					
Other, please specify					

Appendix 2: Introduction letter

Samuel Aguyo (D61/70353/2007)

P O Box 61453 – 00200

Nairobi

Tel 0722881427

Saguyo@yahoo.com

Dear Respondent,

REF: REQUEST FOR INTERVIEW

I am a graduate student at the University of Nairobi undertaking a research on **E-Government Adoption: The Case of User Community within Public Universities in Nairobi**. The research findings will be useful to distil issues of quality dimensions. Information System – IS practitioners in the public sector can use to design better e-Government portals. The directorate of e-government would use these dimensions while developing system structures.

The study will enrich a body of knowledge in the area of digital service delivery in the public sector. It is cross cutting a number of disciplines and will be of academic value to both public administration and IS researchers.

Your kind assistance by way of filling the attached questionnaire is highly appreciated.

Kind regards



Samuel Aguyo