

**IMPLEMENTATION OF THE NATIONAL POPULATION REGISTRY SYSTEM  
IN KENYA**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER IN BUSINESS  
ADMINISTRATION (MBA), SCHOOL OF BUSINESS, UNIVERSITY OF  
NAIROBI**

**2015**

## **DECLARATION**

I hereby declare that the work of this research project is my own except for quotations which have been duly acknowledged. The research project has not been presented for a degree in any other university.

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## **ACKNOWLEDGEMENT**

I wish to acknowledge the support I have received in the cause of writing this Project report to my supervisor Mr. J. T. Kariuki for your guidance has always kept me on course while putting together this project.

Special thanks go to my lecturers and my fellow classmates for their assistance.

## **DEDICATION**

I wish to dedicate this work to my wife Jane, my son Brian, my Daughter Clara and my sister Mary for their moral support during this study. Without their cooperation and understanding this work would not have been accomplished.

## **ABSTRACT**

The Government of Kenya has been implementing the Electronic National Population Register. The main objective of the study was to establish status of implementation of an electronic National population registration system in Kenya and the challenges being experienced. The study adopted a survey design methodology in which primary data was collected through administration of a questionnaire to staff of Directorate of immigration working in Nairobi County. Drop and pick approach was used to collect data. Out of 85 questionnaires administered, 80 were filled and returned giving a response rate of 94%. The study found that many benefits would be achieved by implementing the electronic NPR. The benefits include; support e-services, facilitate faster analysis of demographic data, generating economies of scale in setting up ICT infrastructure, improves sharing of information among government agencies, reduce burden by the public while engaging with the government among others. The study findings revealed that lack of collaboration among the departments within the directorate is a major factor hindering successful implementation of the system. Other factors that hinder successful implementation of the system are; high cost of telecommunication services, lack of clear guidelines to facilitate sharing and protection of individual information, inadequate IT infrastructure and lack of funds to implement the system.

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## ABBREVIATION AND ACRONYMS

CRD	Civil Registration Department
EID	Electronic Identification Card
ICT	Information and Communication Technology
ID	Identity Card
IEBC	Independent Electoral and Boundaries Commission.
IPRS	Integrated Population Register System
KNBS	Kenya National Bureau of Statistics
KNHRC	Kenya Human Rights Commission
KRA	Kenya Revenue Authority
MNIC	Multipurpose National Identity Card
NHIF	National Hospital Insurance Fund
NPR	National Population Register
NRB	National Registration Bureau
NSSF	National Social Security Fund
OECD	The Organization for Economic Co-operation and Development (OECD)
OSCE	Organization for Security and Co-operation in Europe
TAM	Technology Acceptance Model
UID	Unique Identification Number
UIDAI	Unique Identification Authority of India
UNECA	United Nations Economic Commission for Africa
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistics Division
WHO	World Health Organization



## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background**

The world has experienced immense growth in Information and Communication Technology (ICT), resulting in major transformation in social, economic, business operations and processes (Rafiq & Ameen, 2013). This growth has led to the adoption of ICT by government in rendering services to the public commonly referred to as e-government. Electronic government (e-government) is often heralded as the new way of service delivery for the public sector in both developed and developing countries. There are several examples of how e-government has led to enhanced service delivery for instance through payment of utility bills, online registration of companies, online filling of tax returns, and online renewal of drivers license.

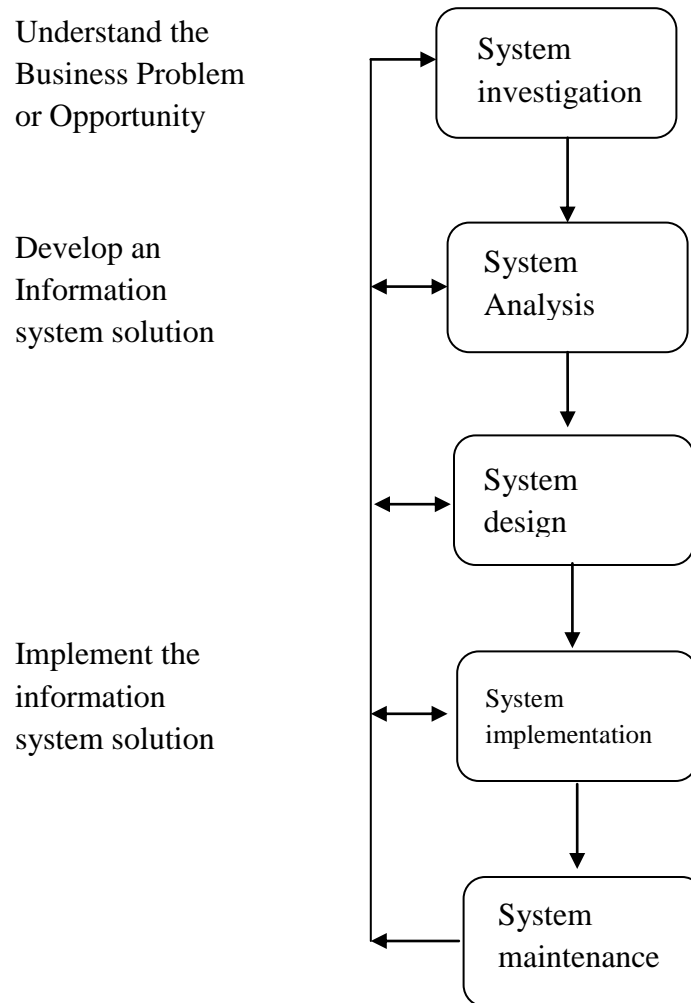
The use of information technology in the population-registration system facilitates the establishment of a digital national population register and the integration of all the data maintained in individual registers. A digital national population register is a system of electronically maintained registers (databases) that stores population-registration data in a central location (European Council Directive, 2003). Depending on the model of population registration used, the authority in charge of maintaining the digital national population register should provide online access to data in the register for initial input and subsequent updating only to the authorities designated by law for these purposes.

Information technology should be viewed as a tool for integrating existing registers and increasing efficiency in the sharing of data (Kpendekpo, 1982). The efficiency of the overall system depends primarily on the legislative and administrative framework governing the registration process. In instances where the existing framework provides for the continuous registration of vital information, information technology significantly enhances the efficiency of data sharing within the system.

### **1.1.1 Implementation of Information Systems**

Implementation of new information systems is a significant investment for organizations and government. Since information systems are socio-technical systems, development involves the joint design of activity systems and ICT systems (Davies, 2009). Davies (2009) presented information system implementation stages which are concerned with a number of key activities in the process. In addition, this information system implementation process concept is similar to O'Brien (2004) who explained a five-step process called the information systems development cycle which includes the steps of: investigation; analysis; design; implementation; and maintenance (see Figure 1). The first phase of information system development process is systems investigation or system conception which is aimed to determine how, based on informatics planning and management, to develop a project management plan and obtain management approval. Systems analysis is focused on identifying the information needs and developing the functional requirements of a system. Systems design is the process of planning a technical artifact and developing specifications for hardware, software, data, people, and network. In addition, this phase involves building the information system to its specifications. System implementation involves delivery of systems, testing the system,

training people to use the system, and converting to the new business system. Finally, system maintenance is the process of making necessary changes to the functionality of an information system (O'Brien, 2004; Davies, 2009).



**Figure 1.1 Information System Development Cycles (source: O'Brien, 2004: p. 345)**

Information system implementation is described as an effort that requires the expertise, insights and skills of several individuals (Tiwana & McLean, 2005). Developing and implementing an information system is very critical to the success of the government service delivery. According to Halonen (2004) properly implemented information systems can make organizations more flexible and agile. On the other hand, poorly

implemented information systems can have damaging effects on organization performance and can cause it to fail in service delivery to the clients.

Information systems implementation comes with a number of challenges to both the institutions that are implementing it and their customers. According to Yeates & Cadle (2001) the major challenges faced in IS implementation include; lack of management support, lack of user involvement, resistance to change, lack of change management program and poor project management. Burke, et al, (2001) points out that poor skills set among users is a hindrance to project implementation. Lack of skilled staff in organizations leaves them grappling with the system challenges during and after implementation. Communication barrier is another aspect which must be managed well in order to pass the correct message to other employees in the organization.

Successful implementation of ICT systems results in benefits to the organization; cost saving, better information handling, timely and accurate information for decision making and competitive edge (Otieno, 2008).

### **1.1.2 National Population Registration System in Kenya**

Population data is key component in planning for a country. Government that has accurate information about its population is able to plan for the future of its citizen in a correct and effective way (UNSD, 2001). The population register is a system for continuous recording of selected information pertaining to each member of the resident population of a country or area, making it possible to access up-to-date information about the size and characteristics of the population at selected points in time (OSCE, 2009). In

implementing population registration a country is interested in data about the population living in or originating from a specific territory (Kpendekpo, 1982). It is in a citizen's interest to participate in the registration process because the registration is a precondition for exercising rights (for example, registration is required in order for a person to be enlisted in the voter list) (OSCE, 2009). The purpose of a population-registration system is to create and maintain one or more data sources to provide the legal documents and notifications necessary to establish and protect the civil rights of data subjects (i.e. the individuals about whom the data are being collected).

Population registration should not be confused with civil registration. Civil registration is primarily carried out for the provision of legal documents and statistical purposes, and is limited to the collection and registration of live births and foetal deaths, marriages, divorces, marriage annulments, judicial separations, adoptions, legal changes of name and recognition of children (Torpey, 2000). Population registration includes some (or all) of the events covered by civil registration, but also includes a wider range of events, such as the establishment of a place of residence and change of address (Olivier, 2011).

Registration in Kenya is carried out by the Department of Civil Registration (registration of births and deaths) and The National Registration Bureau (issuance of identity cards), both in the Ministry of Interior and Coordination of National Government. Registration of births and deaths was introduced for the first time in Kenya in 1904 and applied only to the Europeans and Americans. In 1928 Act CAP.149 was enacted. This Act only provided for the compulsory registration of deaths of Africans but not for their births. After independence in 1963 compulsory registration of all births and deaths was extended

in phases to other parts of the country beginning with Nairobi and Nyeri on 1st March 1963. On 1st September 1971 it became compulsory to register all births and deaths occurring in Kenya.

The identity card has also evolved over the years. The earliest identity card was worn around the neck by registered male Africans. After independence, the earliest identity card was replaced by the First generation identity cards. The First generation identity cards were issued until 1995 when the Government started a massive campaign to replace these cards with the Second Generation cards. A number of weaknesses that necessitated the shift to Second generation cards included: illegal registration of aliens; easy manipulation, forgeries and theft; easy duplication of identity card numbers; delay in replacing lost identity cards and double registration. In sum, these were seen as matters of national security concern. The Second generation identity card has to some extent addressed some of those initial concerns. This has been enabled through the use of modern technology that provides a secure identification document by applying the service of computerized Fingerprint system. So far the National Registration Bureau holds bio-data of over 24 million Kenyans.

Over the years the Government of Kenya has been holding information about its Citizens in different Government agencies (databases), which were not integrated to share or communicate with each other e.g. Birth and Death records, National identification card records, IEBC records, K.R.A, Immigration, Refugees and alien's records. This has since changed due to development of a Digital National population Register commonly referred to as Integrated Population Registration System (IPRS).

The National Population Register (IPRS) is a central database that brings together over a dozen databases held by various government agencies. It combines data from the birth and death register, citizenship register, ID card register, aliens register, passport register and the marriage and divorce register. It also compiles details from the elections register, tax register, drivers register, National Social Security Fund (NSSF) register, National Hospital Insurance Fund (NHIF) register and the Kenya National Bureau of Statistics (KNBS) register.

The idea of developing an Electronic National population register in Kenya was conceived in 1989 though the system has not been developed by the successive Governments until 2010 when the development of Integrated Population Registration System began. The system development has since been completed, but the system is yet to be deployed for enrollment purposes. The research will therefore unearth the hindrances that have hampered successful deployment and adoption of the National population register and recommend strategies that can be used to achieve full implementation of the system.

## **1.2 Statement of the Problem**

Organizations invest enormous amount of resources in information systems in order to have a competitive edge, reduce cost in operations, faster storage and retrieval of information (O'Brien, 2004). The success and failure of system implementation will largely be determined by how an institution handles the process of system implementation which is equally important in any project (Ndou, 2004). The need for effective information systems development and implementation is inevitable and more so by government agencies and thus constitute an integral factor in the ongoing development

of the business processes (Gichoya, 2005). Although the challenges faced in implementation of information systems are many, government agencies today are literally being forced into the implementation of information systems for better service delivery and enhancement of National security.

All over the world population registers are changing from paper-based files to digitalized registers and from decentralized registers to interoperable registers, although situations differ strongly from country to country (Olivier, 2011). Moreover in the last decades many countries have adopted laws on transparency and access to public information on the one side and laws preserving the privacy rights of individuals on the other. According to Torpey (2000), data from population registers are subject to tensions between (notably) security, privacy, interoperability, usability and intrusiveness, and experience in using such data is still lacking in most countries.

In the developing world, lack of identity documents and digital identity systems has contributed to a poverty cycle and societal exclusion that limits access to education, health, banking, and opportunities for personal economic since one requires identity documents to register to financial, education and health institutions. Many developing countries do not have national identity systems in place, and many of the ones that do, suffer from high rates of under-registration (Zelazny, 2012). This means that citizens in those countries have no standard means to verify who they claim to be. This becomes problematic because social programs, banking and aid interventions are based largely on claimed identities, which may or may not be valid, and these interventions may not be reaching the people who need it most (Aadhaar, 2005).

Public sector is quickly adopting electronic-based information systems in service delivery. This initiative has partly been as a result of government policy advisors and international development agencies as well as the need for efficient and modern systems (Avgerou, 2008). In this regard the Government of Kenya embarked on a mission to establish an electronic National Population Register. The system has since been developed and some modules been implemented but not all modules have been implemented or rolled out for use. This research therefore was intended to evaluate the extent to which the electronic national population system is used and establish the challenges that hamper full implementation of the National population register system and propose strategies that can be used to fast track implementation process.

Moreover literature on the implementation of electronic population register system is scarce especially in regard to developing countries (Zelazny, 2012). This was the knowledge gap that this study addresses by attempting to answer the following research questions:(a) to what extent has the electronic national register been used; (b) What benefit can be accrued by fully implementing the electronic national population register; and (c) What challenges hinder full implementation of the electronic national population register?

### **1.3 Objectives of the Study**

The main objective of the study was to establish status of implementation of an electronic National population registration system in Kenya.

The specific objectives of the study were to;

- i. Establish the extent to which the electronic national population register has been implemented.

- ii. Establish the benefits accrued from implementing the system.
- iii. Determine the challenges to implementation of the system.

#### **1.4 Value of the study**

The study findings will be useful by the government in general and other public agencies which are in the process of implementing information systems. The study findings will aid the Government in establishing the policies and guidelines that will govern electronic population registration. This study will aid ICT Managers/Project managers when making information systems implementation decisions. To other developing countries this study will help them avoid the various challenges that have been faced by the Government of Kenya while implementing National population register.

The study will contribute to the body of knowledge by filling the existing gap in determining the challenges that hamper implementation of the electronic national population system in Kenya.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter looks in detail the concept of national population register (NPR). It provides a brief on countries which have successfully implemented electronic population registers and benefits accrued from using electronic National population register. Challenges of implementing information systems in Government have been analyzed in detail in order to understand the concept better. Relevant literature regarding electronic population registers has been reviewed.

#### **2.2 Theoretical Review.**

The study will rely on theoretical models to determine the relevant factors that predict the intention to adopt electronic national population register by the government of Kenya. The study will therefore rely on; Technology Acceptance Model (Davis et al. 1989) and the Diffusion of Technological Innovation Theory (Rogers & Shoemaker, 1973).

##### **2.2.1 The Technology Acceptance Model**

The Technology Acceptance Model (TAM) has been used by researchers to explain why a particular system may or may not be acceptable to users (Davis et al., 1989). It postulates that an individual's behavioral intention to adopt a technology is determined by two beliefs perceived usefulness and perceived ease of use. Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use can be considered as

two different dimensions (Hauser et Shugan, 1980; Larcker et Lessig, 1980; Swanson, 1987). Figure 1 illustrates the TAM.

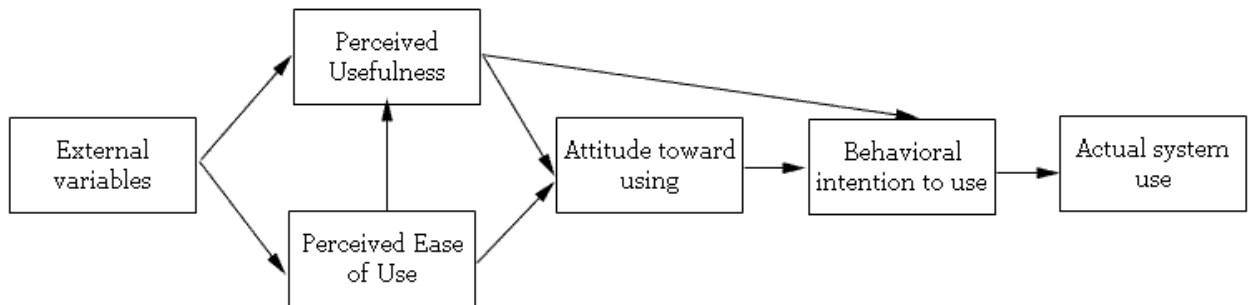


Figure 2 Technology Acceptance Model

Technology Acceptance Model from Davis, Bagozzi et Warshaw (1989)

Based on TAM or its extension, a number of eID adoptions studies have been conducted in different countries. Deane K, (1995) appears to have conducted the first study of user acceptability of eID, based on a questionnaire completed by workers from the banking sector and university administration. In this initial study, eID systems were perceived as less acceptable than traditional identification systems.

### 2.2.2 Diffusion of Innovation (DOI)

The model suggests that there are three main sources influencing the adoption and diffusion of an innovation, namely perceptions of innovation characteristics, characteristics of the adopter, and contextual factors. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system (Rogers 1995). 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). Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest

adopters): innovators, early adopters, early majority, late majority, laggards (Rogers 1995). The innovation process in organizations is much more complex. It generally involves a number of individuals, perhaps including both supporters' and opponents of the new idea, each of whom plays a role in the innovation-decision. This model has been applied to study the adoption of various e-government systems. However, the DOI does not provide information on how to assess innovation characteristics. Furthermore, this model has been criticized for its lack of specificity, (Gagnon, 2010).

### **2. 3 National Population Register**

A population register is a database of residents within a country, with their characteristics (date of birth, sex, marital status, among others) and other socio-economic data, for instance occupation or education. The main administrative functions of population registers are to provide reliable information for the various purposes of government, particularly for program planning, budgeting and taxation; for establishing the eligibility of individuals for voting, education, health, military service, social insurance among others (UNSD, 2001). Population registers are also useful for population estimation, census planning, and census evaluation and for sampling frame of household surveys.

National population registration normally covers the whole country and is usually carried out by administrative units at a low level. In a study done by African-European Institute (1994), in most countries registration is done at district level but people can apply for registration and identity cards through the administrative posts. Copies of the registration files may be kept at a higher administrative level for safety reasons and for easier access to information for administrative or statistical purposes. If two or more administrations are using data from the civil registration a population register may be introduced to

reduce the costs of registration. This will also be beneficial for the individuals since the alternative solution would require them to report their address and other information to two or more different administrative bodies.

A Country's tradition plays a decisive role in determining different countries' approaches to the modernization of their population-registration systems (Arora, 2008). With the development of information technology, countries have been transferring the information contained in their paper registers to computer databases, as well as consolidating their various registers into a single state network. These steps have had two major positive impacts: the efficiency of public administration has been greatly improved; and communication between citizens and administrative bodies is faster and more efficient. While the use of modern technology can support a well-designed population-registration system, it does not guarantee the relevance or accuracy of the data in the system (Torpey, 2000). These are determined primarily by the legal, administrative and institutional framework governing the process of population registration.

A population register is not the first register developed in a country for the purpose of gathering information on its population (Jorgensen, 1989). State and municipal authorities, as well as other legal entities, often collect personal data for existing or possible users of public services, thus developing institutional registers. In such case, the state will have very little control over access to and the sharing of personal information or protection of privacy. Implementing an electronic population register that maintains up to date information on citizen and by sharing this information with interested agencies, a country eliminate the need for multiple databases (Torpey, 2000). Without having a policy in place that govern who should collect and store specific sets of data, unnecessary

overlap of processes are likely, leading to a wasteful duplication of spending on equipment and technology. Moreover, identical information will end up being stored in different formats in different registers, causing confusion and making further development of the system difficult. Different organizations will implement their own development programmes and there will be little compatibility in the various IT architectures created (Jorgensen, 1989).

### **2.3.1 Population Registers in other Countries**

In view of the growing need for a credible identification system around the world due to various factors, like internal security, terrorism, identity theft, illegal migration, Many countries have embarked on the process of implementing electronic population registers while others have already implemented.

Finland has a long history in the field of electronic population registers (Markus, 2011) and was amongst the first European countries to collect data on population, during the sixteenth century; census lists (local population registers) have been maintained in Finland since 1634. Finland moreover created a centralized population register by law in 1969 and the computer-based register was introduced in 1971, also pioneering in that domain. Finnish citizens have access to the central population registers and request the authority to correct their data. Last the Finnish eID card, introduced in 1999, was the first ever operational national eID scheme.

The Kingdom of Belgium conducted a first general population census in 1846. Detailed population registers are operated at the local level and the Belgian National Register worked on the basis of voluntary co-operation of municipalities from 1969 until 1983, when it became mandatory (Poulain, 1987). The National Register contained a strictly

limited data set of local registers. Citizens were not directly able to consult the local registers, except that each individual had the right to request a copy of his/her own data. In 2003 Belgium was also one of the first countries to deploy an e-identity card nationwide (De Cock et al, 2004) and by the end of 2009 all Belgians had an eID card. The eID system made it easier for Belgian National to access their data and update it when required.

In June 2006, the Swiss Parliament adopted a new law on population registers' harmonization in order to simplify statistical data collection and data exchange. Until 2004 vital records (births, deaths, marriages and adoptions) were held on paper registers by 1750 offices throughout Switzerland, but since 2004 there has been a federal centralized database called Infostar (Introduction progressive d'Infostar, 2004). There are furthermore around 2500 resident registers, generally maintained by municipalities. For administrative purposes, Swiss citizens routinely request certified copies of their resident register entry or so-called vital records extracts. In 2009 Swiss citizens barely accepted (50.1%) the introduction of a biometric passport (Passport biométrique, 2009) and one of the hottest topics of the campaign was the possible use of a chip on the future identity card.

In Romania, the population registers were operated at the local level, at the place of residence of each citizen by the Ministry of Administration and Interior, through the National Inspectorate for Population Register, which issued a traditional identity card (Galceava et al, 2010). However, the Personal Identity Number was generated and administered by the National Centre for Managing Databases of Population Register. Citizens had limited access only to their own private data, subject to laborious formal

requests. In July 2010 the Romanian National Registry of Population was centralized and a pilot platform for issuing electronic identity cards was introduced at the beginning of 2011(Romanian Government, 2010).

The Government of India undertook an effort to provide a clear identity to residents first in 1993, with the issue of photo identity cards by the Election Commission and subsequently in 2003, when it approved the Multipurpose National Identity Card (MNIC). The Unique Identification Authority of India (UIDAI) was established in January 2009, as an attached office to the Planning Commission. The purpose of UIDAI is to issue a unique identification number (UID) to all Indian residents that is (a) robust enough to eliminate duplicate and fake identities, and (b) can be verified and authenticated in an easy, cost-effective way (UIDAI, 2010b).

### **2.3.2 Benefits of Electronic Population Registers**

There have been many drivers that have actually led the governments of various nations to take a look into the possibilities of implementing electronic population registers in some way or the other. Enhancement of security through detection of fraud, guard against terrorism and illegal immigration are some of the prime objectives for providing unique identification to the citizens (Davies, Hosein, & Whitley, 2005). Another important use of electronic population registers is authentication of a person's entitlement to government services (Dass & Bajaj, 2008). Countries that have implemented electronic population register have also observed the following advantages; Enhanced timely registration of persons which can be used for the issuance of identification documents, all-round 360-degree view of the citizen, maintaining comprehensive population database, undertaking proper migration management, increase of level of national security, primary source of

citizen information for various government agencies and private entities such as telecommunication agencies, financial institutions, banks etc, improvement of the work flow of state authorities of all levels, updating of voting and other state lists in real time.

An interoperable electronic identity is an ideal access tool for all kinds of e-services of any Government (De Cock et al, 2004). They open the doors for customized service-delivery both in the public and in the private domain. Examples are dedicated access to government databases, personalized access to websites. Without eID E-Government will not go beyond granting access to generic information (De Cock et al, 2004).

Many countries use data from the population register to compile voter lists, to contact voters, and to plan the location of polling facilities (Torpey, 2000). The voter list delivered to the election authorities is often a standard set of data that can be extracted from the population register. If the population-registration system is functioning effectively, an election can be planned and executed within a short time period provided that the administrative conditions (i.e. long period required for creation of voter lists) do not impede the process.

In order to fulfil its duties, a country needs to have information about its citizens (Poulain, 1987). Without accurate knowledge of where citizens reside, for example, implementation of fundamental tasks such as municipal and national planning, the provision of child care, the development of the health sector, or the issuance of identification and travel documents will be burdensome and less effective (UIDAI, 2010b). An up-to-date population register can be a vital element of public-sector planning. According to Torpey (2000) Countries with electronic population register data

on the local population are used in development of public housing, public schools, roads and other public transportation infrastructure. The ability to access historical data in order to identify trends and developments in different areas is also vital. However Poulain (1987) argues that a well-functioning population-registration system is not a precondition for cost-effective public management, but in countries where electronic system is implemented it provides support and key information for public administration and management.

Travel and identification documents, such as passports, identity cards, birth certificates, are usually issued on the basis of data registered in the population-registration system. A population register that is kept up-to-date and clean of multiple entries provides the most reliable data for issuing of travel documents thus lowering security risks resulting from attempts to obtain multiple documents based on false identities (Galceava et al, 2010). If the information in the register is accessible via a computer network by the issuing authorities, such documents could then be issued by any registration office in the country (Markus, 2011). This also facilitates freedom of movement, as it allows citizens to choose where to have passports issued instead of being forced to travel to a specific location.

Identity theft is an increasing problem with an estimated impact of several billions dollars a year. Identity theft, phishing and fraud are serious threats that governments need to guard against in order to maintain public confidence in their e-services. An adequate basic security level is needed and can be delivered by an electronic identity.

#### **2. 4 Challenges in Implementing Information Systems in Government**

There are several challenges and barriers that can delay progress of information systems implementation in Government. The variety and complexity of information systems

initiatives implies the existence of a wide range of challenges and barriers to its implementation and management. This section, will briefly discuss the most important and common challenges and barriers based on literature review.

The implementation of information systems faces some technological difficulties such as lack of shared standards and compatible infrastructure among departments and agencies. Also, privacy and security are critical barriers in implementation of information systems in citizen concern. The guarantee by the government will not suffice unless accompanied by technical solutions, transparency of procedures and possibly independent auditing (OECD, 2003).

Lack or weakness of ICT infrastructure is one of the major challenges for information systems implementation. Internetworking is required to enable appropriate sharing of information and open up new channels for communication and delivery of new services (Seifert & Bonham, 2003). For a transition to electronic systems, architecture, that is, a guiding set of principles, models and standards, is needed. Many developing countries suffer from the digital divide (digital divide refers to the gap in opportunity between those who have access to the Internet and those who do not (OECD, 2003), and they are not able to deploy the appropriate ICT infrastructure for information system deployment. However, an ICT infrastructure does not consist simply of telecommunications and computer equipment. E-readiness and ICT literacy are also necessary in order for people to be able to use and benefit from information systems applications (World Bank, 2003). Having the education, freedom and desire to access information is critical to systems efficacy. Presumably, the higher the level of human development, the more likely citizens will be inclined to accept and use electronic services (Ndou, 2004).Therefore,

governments should work closely with the private sector to establish a modern infrastructure that will provide access opportunities to disconnected groups and individuals. This lack of infrastructure is cited as one of the primary barriers to government implementation. Certain government applications require considerable investment in national IT infrastructure

Privacy is a critical issue in the implementation of information systems in both developed and developing countries. Layane & Lee (2001) identified privacy and confidentiality as critical barriers on the way to the information systems implementation. Privacy refers to the guarantee of an appropriate level of protection regarding information attributed to an individual (Basu, 2004). Seifert & Bonham (2003) emphasised that electronic systems should be approached with an eye toward the protection of individual privacy. Both technical and policy responses may be required when addressing the privacy issue in an information systems context. The difficulty of protecting individual privacy can be an important barrier to systems implementation. In addition, there is a need to deal effectively with privacy issues in electronic networks in order to increase citizen confidence in the use of electronic services. Citizen confidence in the privacy and careful handling of any personal information shared with governmental organizations is essential to government applications. Moreover, citizens are deeply concerned with the privacy of their life and confidentiality of the personal data they are providing as part of obtaining government services. Thus, they pointed out that privacy and confidentiality must remain priorities when establishing and maintaining web sites in order to ensure the secure collection of data.

Since privacy protections are difficult to interject once a system has been built, the planning and design of information systems must include privacy considerations. A comprehensive privacy policy should specify citizens' rights to privacy and mandate that personal data be collected and processed only for legitimate purposes (Teeter & Hart, 2003). At the centre of most government applications is the collection and management of large quantities of citizen data such as names, addresses, phone numbers, employment histories, medical records and property records. It is important to note that different countries have different legal and cultural understandings of what constitutes privacy (Seifert & Bonham, 2003)

Security is one of the most significant challenges for implementing information systems. Many studies have found that security is one of the major obstacles. Security means protection of all information and systems against any disclosure to unauthorized access, or unauthorized modifications or devastation (Udo, 2001). Thus, it refers to protection of the information systems, assets and the control of access to the information itself (Basu, 2004). It is a vital component in the trust relationship between citizens and government. Security issues may present the largest obstacle to the development of electronic services. Thus, security policies and standards that meet citizen expectations are an important step toward addressing these concerns (Sharma & Gupta, 2003). Smith (2002) emphasised that the use of security solutions, including digital signatures, encryption, user names passwords, customer unique numbers, bank account numbers, and others being transmitted over the internet and stored electronically can help in fulfilling security goals in government applications. Furthermore, (Seifert & Bonham, 2003) point out that information security, referred to as cyber security or computer security is an important

systems challenge. In addition, security involves continuous vigilance and protection against the increasing danger of worms and viruses. Also, people need to be educated on the importance of security measures, such as private passwords, to ensure their own protection. Feng (2003) advised that, a body of security professionals should be setup to respond to threats and breaches. Also the need for authority and an infrastructure encryption system has to be given top priority.

The implementation of information systems is not a pure technical issue only, but rather an organizational issue (Feng, 2003). Organizational challenges include: Top management support, Resistance to change to electronic ways, Collaboration and Lack of qualified personnel and training.

The implementation of information systems needs the support from the leaders and top management of the organization for successful implementation. Top management support refers to the promise from leaders to accept, support and adopt the information systems applications. Therefore, it plays a significant role in the adoption and implementation of systems (Akbulut, 2003). In fact, leadership is one of the main driving factors in every new and innovative project or initiative, so it is necessary for the implementation of information systems (Feng, 2003). The support from high-level is vital to systems development, the gaining of required resources and training, the cooperation and coordination between partners and stakeholders for a successful of systems implementation (Seifert & Bonham, 2003)

Information systems brings changes in the work place i.e. transformation from manual methods of work to electronic ones. These new changes will create a new advanced

environment completely different to what has been used for many years in organizations (Feng, 2003). Realin (2004) mentioned that many employees see information systems implementation as a threat to their positions and fear losing their jobs and power. However, to decrease the resistance to electronic systems employees have to understand the importance and significant of information systems and make sure that they won't endanger their jobs, but through retraining and skill developments, the employees can be reassigned new roles. Moreover, it is important that management identify the sources of resistance and create a plan for treat them (Chang, 2002).

Lack of ICT skills is a major challenge to an electronic systems implementation, especially in developing countries (Ndou, 2004). Information systems can be implemented successfully if qualified personnel are available to take the role of start and develop the systems (Sharma & Gupta, 2003). In general, it is important to focus on training and education programs for enhancement when implementing information systems. However, training is a fundamental prerequisite as the rate of change increases and new technologies, practices and competitive models appear. The full economic benefits of ICT depend on a process of training and learning skills, which is still at an important stage for all governments (OECD, 2003).

Moon (2002) declared that the lack of financial resources is considered as significant obstacle to the implementation of government information systems in many countries. It is necessary to ensure the availability of the existing and expected budgetary resources in order to achieve the goals. The most serious and significant barrier to the implementation of government information systems is a lack of money; information systems implementation is expensive. Carvin et al., (2004) stated that because of the high cost of

implementation and maintenance the computer systems, many countries are in a dilemma of funding e-government programs, even when a government entity has a plan for effective and accessible e-government. Feng (2003) stated that a major obstacle to e government is the lack of finance for capital investment in new technology. West (2001) noted that the abilities of government offices to place services online and to use technology for democratic outreach are hampered by budget considerations. Finally, the total cost, including the high cost of systems hardware and maintenance, softwares, training and education, are always seen as major barriers inhibiting agencies and governments from using the technologies.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter describes the research design, target population, sampling design, data collection and research procedures and the techniques for data collection and analysis.

#### **3.2 Research Design**

In this study, descriptive survey design was adopted. A descriptive study is carefully designed to ensure complete description of the situation, making sure that there is minimum bias in the collection of data and to reduce errors in interpreting the analysed data. According to Cooper & Schindler (2003), descriptive studies are more formalized and typically structured with clearly stated hypotheses or investigative questions. It serves a variety of research objectives such as descriptions of phenomenon or characteristics associated with a subject area of population that can be used to define the characteristics of the whole population, and discovery of associations among different variables

#### **3.3 Population of the Study**

According to Mugenda & Mugenda (2003), a population is defined as all elements (individuals, objects and events) that meet the criteria for inclusion in a study. The population of interest for this study was all staff at the Directorate of Immigration and Registration of persons working in Nairobi County. As at 31<sup>st</sup> August 2015 the total number of staff in the directorate working in Nairobi County was 850.

### **3.4 Sampling Procedure and Sample Size**

Due to the large number of the target population at the directorate, a stratified random sample of ten percent was chosen from staff at Nairobi County for inclusion in the study. This resulted in a sample size of eight five staff drawn from clerk, ICT, registrar and Top management cadre.

### **3. 5 Data Collection Methods and Procedures**

The research used primary data. Primary data was collected through semi-structured questionnaire. The questionnaire had four sections. Section A captured the demographic information of the respondents. Section B had questions aimed at finding the extent to which the national population register was been used. Section C had questions aimed to find out the benefits that will be accrued from full implementation of the electronic national population register. Section D contained questions relating to challenges encountered in the deployment of the National population register system. The questionnaire was administered by the researcher to registration officers, clerical officers, ICT officers and senior staff.

### **3. 4 Data Analysis**

All questionnaires from the respondents were checked for completeness. The data was coded and entered into SPSS (Software Package for Social Sciences). Data in section A regarding demographics was analyzed on percentages. Data in section B regarding the extent of use of the electronic national population register was measured using five points likert scale and was analyzed on frequencies and percentages. Data in section C regarding the benefits of implementing electronic national population register was measured using five points likert scale and was analyzed on frequencies and percentages. Data in section

D regarding challenges in implementing the electronic population register was measured using five points likert scale and was analyzed by factor analysis.

## CHAPTER FOUR

### DATA ANALYSIS, RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents data analysis, presentation and interpretation of the data on the study.

#### 4.2 Response rate

Out of the 85 questionnaires administered, 80 were correctly filled and returned. This represents a response rate of 94%. Mugenda and Mugenda (2003) argued that a response rate of 50 percent is adequate, a response rate of 60 percent is good, and a response rate of 70 percent is very good. Therefore, the 94 percent response rate reported for this study formed an acceptable basis for conclusions.

#### 4.3 Demographic Characteristics of the Respondents

This section focuses on the demographics of the respondents i.e. the gender, respondent's age bracket, level of education, respondent's position in the directorate, and number of years worked.

##### 4.3.1 Distribution of the Respondent by Gender

The study revealed that 61.3 % of the respondents were male while 38.8 % of the respondents were female. Table 4.1 presents the respondents distribution by gender.

**Table 4.1 Distribution of the Respondent by Gender**

Gender	Frequency	Percent
Male	49	61.3
Female	31	38.8
Total	80	100.0

Source, Field data 2015

#### 4.3.2 Distribution of the Respondent by Age

Analysis of the respondents' age showed that the ages ranged from 18 to over 50 years. Among the 80 respondents, 61 were aged between 18 and 40 years and this age group was the majority in number (78.8%). Table 4.2 shows the age group frequencies and percentages.

**Table 4.2 Distribution of the Respondent by Age**

Age Bracket	Frequency	Percent
18 to 25	1	1.3
26 to 30	17	21.3
31 to 35	32	40.0
36 to 40	13	16.3
41 to 45	6	7.5
46 to 50	10	12.5
above 50	1	1.3
Total	80	100.0

Source, Field data 2015

#### 4.3.3 Distribution of the respondent by Level of Education

Analysis of the respondents' education level revealed a range of different education levels. As shown in Table 4.3, 80.1% of the respondents hold university or post-graduate degrees. Of these, 53.8% hold a Bachelor's degree and 26.3% hold a Master's degree. Overall, this indicates a high level of education among the respondents.

**Table 4.3 Distribution of Respondents by Level of Education**

Level of Education	Frequency	Percent
Diploma	16	20.0
Degree	43	53.8
Masters	21	26.3
Total	80	100.0

Source, Field data 2015

#### 4.3.4 Distribution of the Respondent by Position

Analysis of the respondents' position in the Directorate revealed that 18.8% of the respondents were clerks, 13.8% were ICT Officers, 52.5% were registrars, 5% were assistant directors and 10% of the respondents were senior assistant directors. Table 4.4 indicates the respondent's distribution by position in the Directorate.

**Table 4.4 Distribution of the Respondent by Position in the Directorate**

Position	Frequency	Percent
Clerk	15	18.8
ICT officer	11	13.8
Registrar	42	52.5
Assistant Director	4	5.0
Senior Assistant Director	8	10.0
Total	80	100.0

Source, Field data 2015

#### 4.3.5 Distribution of the Respondent by Experience

Analysis of the respondents' by years worked revealed that majority of the respondents (62.5%) have worked for a period of between 6 to 10 years. Table 4.5 indicates the respondent's distribution by length of service in the Directorate.

**Table 4.5 Distribution of the respondent by Length of service**

Years	Frequency	Percent
Below 5 years	5	6.3
6-10 years	50	62.5
11-19 years	13	16.3
Above 20 years	12	15.0
Total	80	100.0

Source, Field data 2015

#### **4.4 Extent to which the Electronic National Population Register has been implemented**

The first objective of the study sought to establish the extent to which the National Population Registration system is been used. The questionnaire had twenty two questions that addressed this objective. The questions were included in the questionnaire and respondents were asked to state the extent to which they use the system to perform the activities indicated by the statements in a Likert scale with; 1 = No extent, 2 = Small extent, 3 = Moderate extent, 4 = Great extent and 5 = Very great extent. The data was analysed using frequencies and percentages.

**Table 4.6 Extent of use of the Electronic National Population Register**

Processes	No extent %	Small extent %	Moderate extent %	Great extent %	Very Great extent%
Registration of birth	53.8	27.5	13.5	5	-
Registration of Deaths	58.8	27.5	11.3	2.5	-
Issuance of births certificates	12.5	57.5	26.3	3.8	
Issuance of death certificates	16.3	58.8	21.3	2.5	1.3
Analysis of demographic statistical reports	53.8	22.5	12.5	8.8	2.5
Issuance of identity cards	20.0	38.8	25.0	10.0	6.3
Issuance of aliens cards	10.0	45.0	35.0	3.8	6.3
Registration of refugees	22.5	42.5	25.0	5.0	5.0
Sharing of data With NHIF about the parentage of a child	3.8	8.8	56.3	28.8	2.5
Issuance of passport	-	3.8	43.8	42.5	10.0
Sharing of data between departments in the directorate	-	8.8	40.0	42.5	8.8
Sharing of data with Kenya Revenue Authority	1.3	3.8	26.3	63.8	5.0
Sharing of data with telecommunication companies	3.8	3.8	27.5	58.8	6.3
Sharing of data with Independent electoral and boundaries companies	22.5	21.3	27.5	27.5	1.3
Sharing of data with security agencies	23.8	23.8	21.3	27.5	3.8
Sharing of demographic statistical reports with Kenya National Bureau of Statistics	33.8	13.8	27.5	22.5	2.5
Sharing of Data with Pensions department	-	12.5	36.3	46.3	5.0
Sharing of data with banks	2.5	8.8	16.3	60.0	12.5
Verification of information by insurance companies	10.0	12.5	32.5	37.5	7.5
Verification and screening of foreigners at border points	15.0	16.3	46.3	21.3	1.3
Sharing of data with credit reference bureau	10.0	17.5	35.0	32.5	5.0
Verification of nationality by the foreign embassies	15.0	43.8	26.3	11.3	3.8

Source, Field data 2015

The findings of the study revealed the electronic NPR is not used for registration of Kenyans. With 53.8% of the respondents stating that the system is not used for registration of births while 38.8% of the respondents indicating that the system is been used to a small extent to issue identity cards.

The results in the Table 4.6 also shows that the Electronic NPR is been used in sharing of information between government agencies. For instance an average of between 25% to 45% of the respondents stating that the system is been used to a moderate extent to share information with K.R.A, pension departments, security agencies, I.E.B.C, NHIF,KNBS and foreign embassies while between an average of 30% to 50% stating that the system is been used to a great extent.

The results of the study revealed that Electronic NPR is been used to a great extents to share information with the private sector with 58.8%, 60.0% and 37.5% of the respondents stating that the Electronic NPR is been used to a great extent to share information with the Telecommunication companies, banks and insurance companies respectively.

#### **4.5 Benefits accrued from implementing the system**

To achieve this objective the respondents were required to indicate the extent to which they agreed with the listed statements in a Likert scale with; 1= Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, and 5= Strongly Agree. The data was analysed using frequencies and percentages.

**Table 4.7 Benefits of the Electronic National Population Register**

Activities	Strongly Disagree%	Disagree %	Undecided %	Agree %	Strongly agree %
Supporting e-services.				72.5	27.5
Enables easier identification of Kenyan during registration and therefore reduces issuance of statutory documents to non Kenyans.		1.3	2.5	55	41.3
Facilitates faster verification of once details.			1.3	41.3	57.5
Facilitate faster analysis of demographic statistical reports		1.3	6.3	40.0	52.5
Improves the quality of statistical Data		17.5	7.5	36.3	38.8
Generating economies of scale in setting up ICT Infrastructures e.g. recovery sites			5.0	47.5	47.5
Reduce cost in rendering services to the public		3.8	3.8	48.8	43.8
Facilitates online self service.		1.3	2.5	46.3	50.0
Reduce time required to obtain statutory documents.			1.3	50.0	48.8
Improves sharing of information among government agencies			1.3	31.3	67.5
Eliminate duplication of efforts in registering Kenyans			2.5	61.3	36.3
Reducing the burden by the public when engaging with the administration			12.5	50.0	37.5
Reducing the possibilities for fraud, identity theft and phishing		1.3	1.3	51.3	46.3
Facilitate updating of voting register in real time.		1.3	13.8	37.5	47.5
Enhanced timely registration of persons			3.8	51.3	45.0
Enhance standardization in government service delivery		2.5	1.3	43.8	52.5
Improvement of the work flow of Government agencies of all levels.		1.3	2.5	55.0	41.3
Average				45.5	43.4

Source, Field data 2015

The results of the study revealed that a myriad of benefits would be accrued by fully implementing the Electronic NPR. For instance 72.5% of the respondents agreed that electronic NPR would support e-services once implemented while 27.5% of the respondents strongly agreed as shown in Table 4.7. On average 45.5% of the respondents agreed that the stated benefits in the questionnaire would be accrued by fully implementing the Electronic NPR while 43.4% of the respondents strongly agreed as shown in Table 4.7.

The finding of the study confirms the literature reviewed on the importance of electronic population register. According to Dass & Bajaj (2008) countries that have implemented electronic population register have observed the following advantages; enhanced timely registration of persons which can be used for the issuance of identification documents, all-round 360-degree view of the citizen, maintaining comprehensive population database, undertaking proper migration management, increase of level of national security, primary source of citizen information for various government agencies and private entities such as telecommunication agencies, financial institutions, banks etc, improvement of the work flow of state authorities of all levels, updating of voting and other state lists in real time.

#### **4.6 Challenges to Implementation of the System**

From the literature review the researcher identified 19 variables that were used to assess the challenges of NPR implementation in Kenya. The variables were included in the questionnaire and the respondents were asked to state the extent to which they encountered with the statements in a Likert scale with; 1 = No extent, 2 = Small extent, 3

= Moderate Extent, 4 = Great Extent and 5 = Very great extent. The data was analysed using factor analysis and the results are presented in Table 4.8, 4.9 and 4.10.

**Table 4.8 Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.273	48.805	48.805	9.273	48.805	48.805
2	1.601	8.428	57.234	1.601	8.428	57.234
3	1.458	7.675	64.909	1.458	7.675	64.909
4	1.202	6.325	71.234	1.202	6.325	71.234
5	.857	4.510	75.743			
6	.831	4.374	80.117			
7	.785	4.132	84.249			
8	.518	2.728	86.977			
9	.445	2.344	89.321			
10	.402	2.115	91.437			
11	.348	1.830	93.266			
12	.283	1.489	94.756			
13	.231	1.215	95.971			
14	.196	1.029	97.000			
15	.190	.999	97.999			
16	.123	.647	98.647			
17	.109	.573	99.220			
18	.083	.436	99.656			
19	.065	.344	100.000			

Extraction Method: Principal Component Analysis.  
Source, Field data 2015

**Table 4.9 Component Score Covariance Matrix**

Component	1	2	3	4
1		.534	.511	.469
2			-.099	-.138
3				-.176
4				

Source, Field data 2015

**Table 4.10 Rotated Component Matrixes**

	Component			
	1	2	3	4
Lack of clear guidelines to facilitate protection of individual's data	.768		.274	.380
Unfavourable government policy to support electronic service delivery	.759	.320	.189	-.199
Lack of clear guidelines to facilitate sharing of individual's information	.727	.112	.223	.423
Lack of Top management support in the implementation process	.644	.222	.329	.262
Poor planning during implementation	.586	.355	.310	.487
Resistant to change by users		.803	.102	.226
Lack of user involvement in developing the system	.143	.681	.607	
Inadequate IT Infrastructure for implementing the National population register	.329	.645	.173	.301
High cost of telecommunications services required to support the system roll out	.486	.616		.159
Lack of funds to roll out the national population register system	.400	.602	.152	.351
Poor design of the system	.108	.581	.570	.270
Lack of collaboration between the departments within the directorate of immigration and registration of persons to support the implementation of the system	.458	.499		.403
Misappropriation of resources meant for implementing the system	.154	.126	.751	.216
Poorly designed user interface	.170	.328	.747	.108
Lack of technical expertise by the staff to support the system	.253	-.146	.643	.206
Promotion and access to the digital content(Digital divide)	.427	.133	.505	.257
Fast Changing technology	.138	.383	.258	.801
Lack of understanding of the importance of the electronic N.P.R Concept	.357	.191	.180	.776
Poor sensitization	.156	.312	.407	.701

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 10 iterations.

Source, Field data 2015

Applying the Social Science rule, which states that only the performance indices with loadings equal to or greater than 0.5 should be considered meaningful (Akinyokun, 2006). Four factors were extracted from the initial principal component matrix generated. In order to obtain realistic and meaningful factor loadings, the initial principal component matrix is rotated orthogonally by varimax, promax and quantimax. The four factors extracted and the loaded performance indices are the following;

Factor 1 loads on:

- a) Lack of clear guidelines to facilitate protection of individual's data.
- b) Unfavourable government policy to support electronic service delivery.
- c) Lack of clear guidelines to facilitate sharing of individual's information.
- d) Lack of Top management support in the implementation process.
- e) Poor planning during implementation.
- f) Lack of collaboration between the departments within the directorate of immigration and registration of persons to support the implementation of the system.

Factor 2 loads on:

- a) Resistant to change by users.
- b) Lack of user involvement in developing the system.
- c) Inadequate IT Infrastructure for implementing the National population registers.
- d) High cost of telecommunications services required to support the system roll out

- e) Lack of funds to roll out the national population register system.
- f) Poor design of the system.
- g) Lack of collaboration between the departments within the directorate of immigration and registration of persons to support the implementation of the system.

Factor 3 loads on:

- a) Misappropriation of resources meant for implementing the system
- b) Poorly designed user interface
- c) Lack of technical expertise by the staff to support the system
- d) Promotion and access to the digital content (Digital divide)

Factor 4 loads on:

- a) Fast changing technology
- b) Lack of understanding of the importance of the electronic N.P.R Concept
- c) Poor sensitization

From the analysis factor 1 points at Top management and policy issues, factor 2 points at users of the system and ICT Infrastructure, factor 3 points at users ICT skills and resources while factor 4 points at training and sensitization.

Table 4.8 presents the eigenvalues, percentage contribution and cumulative percentage contribution of the extracted four factors. The four factors contribute a total of 71.234% to challenges of implementation of the Electronic National Population Register. The factor described as ‘Policy and Top management’ contributes 48.805% out of the 71.234%. This statistics suggests that implementation of information’s systems would fail if they is no clear policy and plan to guide in the implementation of the system with lot of

emphasis on privacy and sharing of individuals data. This finding corroborates with the position held by Seifert & Bonham and Layane & Lee. Layane & Lee (2001) identified privacy and confidentiality as critical barriers on the way to the information systems implementation. Seifert & Bonham (2003) emphasised that electronic systems should be approached with an eye toward the protection of individual privacy.

The factor described as 'Users and Infrastructure' contributes 8.428% out of the 71.234%. These findings suggest that system implementations would fail if there is no adequate user involvement and ICT infrastructure to support the implementation of the system. These findings collaborate with the literature reviewed on challenges of implementing information systems. Lack or weakness of ICT infrastructure is one of the major challenges for information systems implementation. The findings revealed that high cost of telecommunication services and high cost of telecommunications services required to support the system roll out is a challenge in implementing electronic NPR. According to Seifert & Bonham, (2003), Internetworking is required to enable appropriate sharing of information and open up new channels for communication and delivery of new services.

The factor described as 'ICT knowledge and resources' contributes 7.675% out of the 71.234%. These findings indicate that financial resources and ICT skills are paramount in successful implementation of information systems. These findings concur with literature reviewed. Moon (2002) declared that the lack of financial resources is considered as significant obstacle to the implementation of government information systems in many countries. While lack of ICT skills is a major challenge to an electronic systems implementation, especially in developing countries (Ndou, 2004). Information systems

can be implemented successfully if qualified personnel are available to take the role of start and develop the systems (Sharma & Gupta, 2003).

The factor described as 'Training and sensitization' contributes 6.325% out of the 71.234%. These findings suggest that ICT skills are necessary for smooth implementation of information systems. These findings confirm the literature reviewed on E-readiness. E-readiness and ICT literacy are also necessary in order for people to be able to use and benefit from information systems applications (World Bank, 2003). Having the education, freedom and desire to access information is critical to systems efficacy. Presumably, the higher the level of human development, the more likely citizens will be inclined to accept and use electronic services (Ndou, 2004).

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of findings, conclusions and recommendations. It is divided into five sections; the first section presents the summary of findings, the second section presents conclusions of the study, the third section presents limitation of the study, the fourth section presents recommendations of the study while the fifth section presents suggestions for further research.

#### **5.2 Summary**

The main objective of the study was to establish status of implementation of an electronic National population registration system in Kenya. Descriptive statistics were used to analyse data for objective one and two and results were presented in frequency and percentages. Factor analysis was used to determine challenges hindering implementation of Electronic NPR. The findings on the extent of NPR implementation in Kenya indicate that the system is used more in sharing information between government's agencies and private companies for instance Bank, Telecommunication companies among others. The second objective sought to determine the benefits of electronic NPR. The study found that many benefits would be achieved by implementing the electronic NPR. The benefits that would be accrued include; support e-services, facilitate faster analysis of demographic data, generating economies of scale in setting up ICT infrastructure, improves sharing of information among government agencies, reduce burden by the public while engaging with the government among others. The third objective sought to determine the challenges to implementation of the electronic NPR system. The study

findings revealed that lack of collaboration among the departments within the directorate is a major factor hindering successful implementation of the system. Other factors that hinder successful implementation of the system are; high cost of telecommunication services, lack of clear guidelines to facilitate sharing and protection of individual information, inadequate IT infrastructure and lack of funds to implement the system.

### **5.3 Conclusion**

The study noted that the electronic NPR is been used in sharing of information among the government agencies and private companies. However the study revealed that the system is been used to a small extent to register Kenyans. For full benefits of the electronic NPR to be accrued the system needs to be fully implemented.

The study noted that a number of challenges affect systems implementation. As observed in the literature the challenges tend to fall heavily on process and people management. From the study I conclude that lack of collaboration between stakeholders affects implementation of information system. Lack of clear guidelines to facilitate protection and sharing of individuals data also pose a huge challenge in implementing information systems. The study also concludes that high cost of telecommunication services, lack of funds and inadequate ICT infrastructure as other factors limiting implementation of the information systems.

### **5.4 Policy Recommendations**

To improve the success of National Population Register implementation in Kenya, the study recommends; collaboration among the stakeholders implementing the system, improving planning and coordination during implementation, prudent use of financial resources allocated for the systems, setting of clear guidelines to facilitate sharing and

protection of individual's data, sufficient installation of ICT infrastructure to support implementation process.

### **5.5 Limitations of the study**

The researcher encountered various limitations that tended to hinder access to information sought by the study. These included; limited time as the research was being undertaken in a short period which limited the scope covered by the research. The respondents approached were reluctant in giving information fearing that the information sought would be used to print a negative image about the Directorate of Immigration. The researcher handled the problem by carrying with him an introduction letter from the University and assured them that the information they gave would be treated confidentially and it was to be used purely for academic purposes. The questionnaire was also designed in such a way that the respondents' identity would remain anonymous. Lack of sufficient funds limited the researcher from accessing all the staff in the Directorate to collect data for study. The researcher however limited himself to the staff in Nairobi County which is representative of the staff in the Directorate of immigration.

### **5.6 Recommendations for Further Research**

The study recommends that more studies should be done in other areas (outside Nairobi) to establish if the same results will hold.

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**APPENDENCES**

**Appendix I: Questionnaire**

This Questionnaire is aimed at collecting data regarding implementation of the electronic national population register. Your department has been selected to participate in this survey. Your participation in this survey will help in informing the Government on which areas to improve in order to fast track the implementation of an electronic national population register.

Thank you for taking your time to answer the questions that follow.

**SECTION A: GENERAL INFORMATION**

1. What is your gender?

Male..... [ ]

Female.....[ ]

2. What is your age bracket in years?

18 – 25 ..... [ ]

41 – 45..... [ ]

26 – 30..... [ ]

46 – 50..... [ ]

31 – 35..... [ ]

Above 50 .... [ ]

36 – 40..... [ ]

3. What is your highest level of education?

O-Level ..... [ ]

Degree..... [ ]

Other

Certificate..... [ ]

Masters..... [ ]

(Specify).....

Diploma..... [ ]

PhD..... [ ]

4. What is your position in the Directorate?

Clerk [ ] ICT Officer [ ] Registrar [ ] Assistant Director [ ] Senior Assistant Director [ ]

6. For how long have you worked in the Directorate?

Below 5 Years ..... [ ]

6 – 10 Years..... [ ]

11–15 Years..... [ ]

Above 20 Years ..... [ ]

**SECTION B: EXTENT OF USE OF THE ELECTRONIC NATIONAL POPULATION REGISTER**

Indicate the extent to which your department uses the electronic national population register system in each of the following activities.

<b>Activities</b>	No extent	Small extent	Moderate extent	Great extent	Very great extent
Registration of births					
Registration of Deaths					
Issuance of births certificates					
Issuance of deaths certificates					
Analysis of demographic statistical reports					
Issuance of identity cards					
Issuance of aliens card					
Registration of refugees					
Sharing of data with NHIF about the parentage of a child					
Issuance of passport					
Sharing of data between departments in the directorate					
Sharing of data with Kenya Revenue Authority					
Sharing of data with telecommunication companies					
Sharing of data with independent electoral and boundaries commission. (I.E.B.C)					
Sharing of data with security agencies					
Sharing of demographic statistical reports with Kenya National Bureau of Statistics.					
Sharing of data with pensions department.					
Sharing of data by banks					
Verification of information by insurance companies.					
Verification and screening of foreigners at border points.					
Sharing of data with credit reference bureau					

Verification of nationality by the foreign embassies.					
Other (Specify and rate accordingly)					

**SECTION B: BENEFITS OF THE ELECTRONIC NATIONAL POPULATION REGISTER**

Indicate the level of agreement with each of the following statements in regard to the benefits of utilizing the Electronic National Population Register system.

<b>Benefits</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Undecided</b>	<b>Agree</b>	<b>Strongly agree</b>
Supporting e-services.					
Improving security when transacting with others online. E.g. on olx, Jumia etc					
Enables easier identification of Kenyan during registration and therefore reduces issuance of statutory documents to non Kenyans.					
Facilitates faster verification of once details.					
Facilitate faster analysis of demographic statistical reports					
Improves the quality of statistical Data					
Generating economies of scale in setting up ICT Infrastructures e.g. recovery sites					
Reduce cost in rendering services to the public					
Facilitate online self service.					
Reduce time required to obtain statutory documents.					
Improves sharing of information among government agencies					

Eliminate duplication of efforts in registering Kenyans					
Reducing the burden by the public when engaging with the administration					
Reducing the possibilities for fraud, identity theft and phishing					
Facilitate updating of voting register in real time.					
Enhanced timely registration of persons					
Enhance standardization in government service delivery					
Improvement of the work flow of Government agencies of all levels.					
Other (Specify and rate accordingly)					

**SECTION C: CHALLENGES IN THE IMPLEMENTATION OF NATIONAL POPULATION REGISTER**

Indicate the extent to which the department has encountered each of the listed challenges in full implementation of an Electronic National Population Register.

<b>Challenges</b>	No extent	Small extent	Moderate extent	Great extent	Very great extent
Resistance to change by users					
Inadequate IT Infrastructure for implementing of National population register					
Poor design of the system					
Lack of user involvement in developing the system					
Poorly designed user interface					
Unfavorable government policy to support					

online/electronic service delivery					
Lack of top management support in the implementation process.					
Poor planning during implementation					
Lack of collaboration between the departments within the directorate of immigration and registration of persons to support the implementation of the system.					
Lack of technical expertise by the staff to support the system					
High cost of telecommunications services required to support the system roll out.					
Lack of clear guidelines to facilitate sharing of individual's information.					
Lack of clear guidelines to facilitate protection of individual's data.					
Lack of funds to roll out the national population system.					
Misappropriation of resources meant for implementing the system.					
Lack of understanding of the importance of the electronic N.P.R concept					
Fast changing technology					
Poor sensitization					
Promotion and access to the digital content (Digital divide)					
Other (Specify and rate accordingly)					

*\*Thank you for your responses in this questionnaire\**