MAASAI MARA UNIVERSITY

SCHOOL OF SCIENCE

DEPARTMENT OF COMPUTING AND INFORMATION SCIENCES

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COM 423 COMPUTER SCIENCE PROJECT

CIVIL REGISTRATION SYSTEM

FINAL REPORT

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Final report submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in computer science

DECLARATION

I hereby declare that this work is genuine and has never been presented for any degree award in any institution of higher learning.

Signature……. Date……..

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This project has been submitted for examination and approval by the project supervisor.

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DEDICATION

I dedicate this work to my loving parents James and Mildred Ochieng who gave me moral and financial support in all my academic endeavors. Most importantly, I thank the Almighty God for having granted me life.

ACKNOWLEDGEMENT

I would like to thank the Almighty God for granting me good health and strength during the creation of this software system. I would also like to appreciate the work of my lecturers Mr. Mutua, my immediate supervisor, for guidance and encouragement and Mrs. Esther Imbamba for having guided us on software development cycle.

Special tributes goes to my dear parents for having given me the much needed financial support and divine prayers that have enabled me accomplish this project.

Finally, much appreciations also goes to my classmates who stood by me giving me encouragement and support during the development of this project.

ABSTRACT

Civil registration system is a system used to register and display birth and death records of a certain group of people. This system is used in countries such as India to collect data on birth and death records.

Chapter one highlights the existing manual system and its weaknesses. It also discusses the problem definition, justification, scope of study, aims and objectives of the current system.

Chapter two covers literature review which discusses on the existing civil registration systems.

Chapter three discusses research methodology such as system development cycle.

Chapter four highlights the system analysis and modelling.

Chapter five discusses the systems design.

Chapter six enumerates on the implementation of the system.

Chapter seven highlights the limitations, conclusion and recommendations of the system.

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CHAPTER ONE: INTRODUCTION

1.1 RATIONALE

1.1.1 INTRODUCTION

Kenya's civil registration system is still paper based. There have been efforts by the Kenyan government to digitize all manual registration processes such i-tax but unfortunately it has not done enough to digitize civil registration system.

Weakness of the current Kenya's civil registration system

Since the current civil registration system is relies majorly on paperwork it makes the acquisition of birth and death certificates inevitably long, tedious, expensive and prone to human error.

In addition to that, one who plans to go seek for these certificates has to be forced to get permission for being away from their job. This leads to lack of productivity towards the economy of this nation.

There are also alarming levels of bribery since majority of the officials in charge of the registration process takes advantage of the situation and ask for money if at all one has to be served at their convenience.

1.1.2 BACKGROUND

Registration of births and deaths in Kenya has been done manually since time immemorial. In the current age of digital dispensation where computers are easily accessible and used to save time, minimize mistakes and produce accurate results, making use of a manual civil registration system is a complete turn off.

In Kenya like in most other developing countries, registration of vital events dates back to colonial period. During and after the colonial era, it was mandatory that all vital events (deaths, births, marriages and divorces) were to/be reported to a central registration office which had overall supervisory control of the system. In post-colonial era, gradually developed that each and every

registration laws were again but the Government also made it mandatory individual was under the statutory obligation to register vital events. All the events were to be registered either in their places of occurrence or place of residence.

Any Midwife, Traditional Birth Attendant (TBA), or Physician present at the delivery point or place of occurrence was required by law to report the event to the local registration office. However, where no such agents were present, the mother was obliged to report the event to the local chief who, was then to communicate the same to the local registration office.

Although vital registration system has been in existence since the colonial era, it was not without problems. First, the system was so inefficient that most vital events went unrecorded. Secondly, the idea of forced registration, having historically been introduced by the colonial authority, was usually resented by the indigenous population. Even after independence, the registration process was viewed "more as an alien exercise rather than a service to the people. To date, the expression "registration" will by itself evoke unpleasant reminiscences to certain quarters of the population, particularly the traditional rural societies with deeply rooted cultural beliefs and historical practices associated with the particular event. However, with the expansion of education and general public enlightenment, people have now 'accepted civil registration as beneficial to them and purely as a government service.

Although efforts were made to improve the civil registration even after independence, not much success was achieved. By 1978, less than' half of all births and slightly less than a quarter of all deaths were registered. Because of this low coverage, it became almost impossible to produce reliable vital statistics required for general administration 'and program development. Similarly, it was not possible for the Government to measure accurately the impact of strategies adopted to reduce the impacts of the key components of demographic changes namely births and deaths.

Realizing the need to further improve and strengthen the civil registration system, the Government, through the technical and financial assistance of UNFPA mounted the civil Registration, Demonstration Project (CROP).

Phase I of the project was launched in 1982 and covered three districts such as Muranga, Kirinyaga and Nyeri. The 'project 'proved a success and in 1984, Phase II of the project was extended to cover Kisumu, Kakamega, Uasin Gishu and' Embu Districts. Five more Districts were incorporated into the program in January 1986 and these included Kisii, Bungoma, Kericho. Machako and Kilifi. To-date, nearly a quarter of the Kenyan population is covered under this project.

1.1.3 PROBLEM DEFINITION

Kenyan parents who have been seeking birth certificates for their children as well those who want to acquire death certificates for their beloved ones who have passed on, residing in Kenya or abroad face a myriad of challenges. The civil registration system will be immensely helpful to them since they will be able to use computers or the government can make plans of availing computers in parts of the country where such facilities are not available. This also go hand in hand with vision 2030 and the current's government promise to ensure that even class one pupils get access laptops and the Minister of ICT's goal to ensure that all counties in Kenya have WIFI connectivity.

The manual system is sometimes so slow that those seeking these certificates have to queue for the whole day without doing anything constructive .Therefore, with the civil registration system in place, all these inconveniences would have been avoided.

The glitches of the manual civil registration system include the following among others:

i. **Time consuming**: There is a lot of time wastage in the queues which could otherwise have been used for productive activities in the economy.

ii. **Errors during data entry:** There tend to be high chances of making errors when entering registration data manually.

iii. **Loss of registration forms:** Sometimes, there arises situations where registration officers can lose forms containing the details of those planning to acquire these certificates forcing them to endure another daunting and tedious process of lining.

1.2 JUSTIFICATION

The civil registration system will commendably enhance the acquisition of birth and death certificates through the use of computers. The existing manual system is cost intensive in terms of buying registration materials and hiring registration officers. The civil registration system uses Microsoft Access database which is well structured, secure and sufficient enough to contain all the registration details. Due to the computerized nature of the system, those in need of registration will be able to do it at their own convenience. The only provision will be access to computers. For the people who might face challenges, some computers could be availed by the county governments to enable proper and extensive guidance to prevent any impending challenges they might face in the course of using the system.

The benefits of this system are immense compared to the costs involved in building and implementing it.

1.3 SCOPE OF THE STUDY

The civil registration system is a Kenyan based system that can be used to enable the registration of births and deaths of Kenyans for the acquisition of the birth and death certificates respectively by the concerned individuals provided they have access to a computer.

1.4 AIMS AND OBJECTIVES

1.4.1 AIMS

To come up with a more user friendly, accurate, cheap, convenient and available civil registration system for Kenya. This will make the application for birth and death certificates easier and faster.

1.4.2 PROJECT OBJECTIVES

The specific objectives of this project are:

i. Reviewing the existing civil registration system.
ii. Develop a reliable civil registration system for Kenya.
iii. Implementing the civil registration system that allows Kenyans to apply for birth and death certificates conveniently.
iv. Authenticate the validity of the system.

1.5 ETHICAL AND PROFFESSIONAL ISSUES

1.5.1 ETHICAL ISSUES

i. The system will eliminate jobs for some staff who may be employed to carry and ferry registration forms.

ii. The system is not prone to human error and cheating and therefore that vice will be eliminated.

iii. Those applying for birth and death certificates will save time because they will not have to queue for hours to acquire them.

1.5.2 PROFESSIONAL ISSUES

The system will introduce professionalism in the registration process because

i. No time wastage in queuing.

ii. The certificates will be produced instantly.

1.6 SCHEDULE

Figure 1: Project Gantt chart

PROJECT GANNT CHART

	FROM	TO	JAN		FEB		MARCH		MAY					
TASK			1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-31
SYSTEM PLANNING AND SELECTION	1/2/16	15/2/16												
PROPOSAL WRITING	16/2/16	28/2/16												
SYSTEMS ANALYSIS AND DESIGN	1/3/16	15/3/146												
SYSTEMS IMPLEMENTATION	16/3/16	15/6/16												
DOCUMENTATION	16/3/16	30/6/16												
DELIVERY	1/7/16	15/7/16												

1.7 RESOURCES

1. Minimum requirements

Software

Windows 2000(sp4)

Windows XP (sp2)

Windows vista (sp1)

Application software

VISUAL STUDIO 2013 PROFESSIONAL

VB.NET 4.0

Access database

Hardware Required

500MHZ processor Pentium 111

1GB RAM

4 GB free hard disk space

A PC /laptop

Supported platform

Personal computer running windows 2000,XP, vista and above

1.8 BUDGET

NAME	ESTIMATED COST
HP laptop Intel duo Core , 160 GB hard disk, 1 GB RAM	Ksh. 19,000
TOTAL	Ksh.19,000

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

Civil Registration System popularly known as birth and death registration system is the recording of vital events that is live births, stillbirths and deaths under the statutory provisions on continuous and permanent basis. The registration records are useful primarily as legal documents and secondarily as a source of statistics. For individuals, it is legal proof of age, identity, nationality, heritance and civil status.

2.2 BACKGROUND

Civil Registration Strengthening efforts began in earnest with the 1st Conference for African Ministers responsible for civil registration in Addis Ababa in August 2010, first regional platform on civil registration.

The Conference was aimed at addressing Governance as well as statistical gaps caused by under registration across Africa.

Isolated project-based and Institution-led ad hoc initiatives have not yielded meaningful results.

Comprehensive Assessment to appraise the civil registration landscape among member countries.

The CA findings should inform country Strategic Plans with a view to addressing the four key areas of a CRVS System. *(Policy and Legal, Operations Management, Cause of death and Statistics)*

APAI-CRVSS also designed and recommended an Operational Frame work for CR systems in Africa.

The Civil Registration Function – under the B&D Registration Act, Cap 149

Registration of all births and deaths occurring in Kenya and of Kenya citizens occurring outside Kenya, archival, preservation and security of births and deaths records, issuance of

birth and death certificates, processing, analysis and dissemination of vital statistics from registration records.

Administrative Framework

In Kenya Civil Registration is a National Government function in the Ministry of Interior and Coordination of National government.

Civil registration system is placed under one directorate which includes The National Registration Bureau, Immigration Services and Refugee Affairs.

Legal Mandate only provides for Vital Events Proper plus Vertical events (Births, Deaths, recognition and legitimation)

Operational Structure

National system of registration with a national office and sub national offices known as district/sub county registries. The Civil registration process is hinged on a community-based system of civil registration.

Local government administrators (Assistant Chiefs) register home events while nurses/clinicians register health facility events.

2.3 SIMILAR WORK DONE BEFORE

In India the system of Civil Registration has been in operation for over a century. Civil Registration System popularly known as birth and death registration system is the recording of vital events that is live births, stillbirths and deaths under the statutory provisions on continuous and permanent basis. The registration records are useful primarily as legal documents and secondarily as a source of statistics. For individuals, it is legal proof of age, identity, nationality, heritance and civil status. Registration of Births and Deaths is done under the Registration of Birth and Death Act, 1969 and the Rules issued by the Government of Andhra Pradesh. Act Features are.

- Registration of births and deaths is done under the Registration of Birth and Death Act, 1969.
- Registration of vital event has to be done at the place of occurrence of the event.
- Provision of registration of birth without the name of the child. Name can be entered later but not after 15 years from the date of registration.
- Correction or cancellation of entries.
- Penalties for non-reporting/non-registration of events. Issue of free certificate of birth/death in case the registration is done within 21 days.
- Event reported after 21 days but within 30 days attracts nominal late fee. Events reported after 30 days but within 1 year are registered with higher late fee along with affidavit to be filed by the person reporting the event.
- Events reported beyond 1 year can be registered with only with the order of the Executive/1st class Magistrate and with late fee.
- Responsibility to report the event:
    - For domiciliary births, head of household
    - For institutional events, in-charge of the institution or any other officer authorized by him/her.

2.6 CIVIL REGISTRATION SYSTEM

Countries across the globe are adopting information technology in their civil registration systems replacing the old methods of paper, mechanical, and punch cards as they strive to increase the number of people being registered. In India (Office of The Registrar General & Census Commissioner, India, 2016), electronic online and offline civil registration system with the following initiatives:

Uniform Software Application for Registration of Births and Deaths

A software application for online and offline registration of birth and death has been developed. This application covers the entire gamut of the Civil Registration System – Registration of events, Generation of certificates and Generation of Statistical Tables and Reports. The application that is presently available in English is being customized in 13 Indian languages.

Database of Institutions

A nationwide database of medical Institutions has been prepared. This comprehensive database has the address, telephone numbers and other contact details of the institutions where events occur. The plan is to electronically monitor the registration of events occurring in these institutions through an ICT enabled platform.

Application to Monitor Institutional Events

An SMS based application called 'Event Monitoring System for Registration has been developed and is currently under pilot testing. This application attempts to track the events at the level of institutions and ensure their registration.

Capacity Building of Registrars

A standard training manual has been developed for training the registration functionaries in 13 languages. Regular training of registration functionaries has been introduced by providing financial assistance to the State Governments.

Data digitization

Project to keep old records in easy to retrieve digital form has been started. This will help in storage of registers in electronic format and allow easy access to the records.

Advocacy and Publicity

An intensive multi-modal publicity and awareness campaigns on birth and death registration is already underway. Plans are being formulated to expand this campaign in all regional languages in order to increase the coverage of the civil registration system.

Demand Generation

Creating a policy environment for demand generation for birth and death registration is one of the basic needs identified by a National task force set up for the strengthening the CRVS. As per its recommendations, the Registration of events has been linked to various welfare schemes of the Government.

National Population Register

India is in the process of setting up a National Population Register (NPR). This is the first step towards the creation of a National Register of Citizens and the issue of a National Identity Card. The Civil Registration System has been linked to the NPR.

2.7 CONCLUSION

Literature review aims at reviewing work which has been done by others and doing a comparison. This helps the researcher to identify unfamiliar areas in the field of interest .It builds the knowledge of the researcher in the field of research and prepares him to handle more challenging research. The researcher is able to build his research on findings of others to avoid re-inventing the wheel and wasting a lot of time and other resources.

It is indeed true that there are other civil registration systems that exist in different countries across the globe. These systems face different challenges according to the writers. Kenya has her unique problems which this system will help solve.

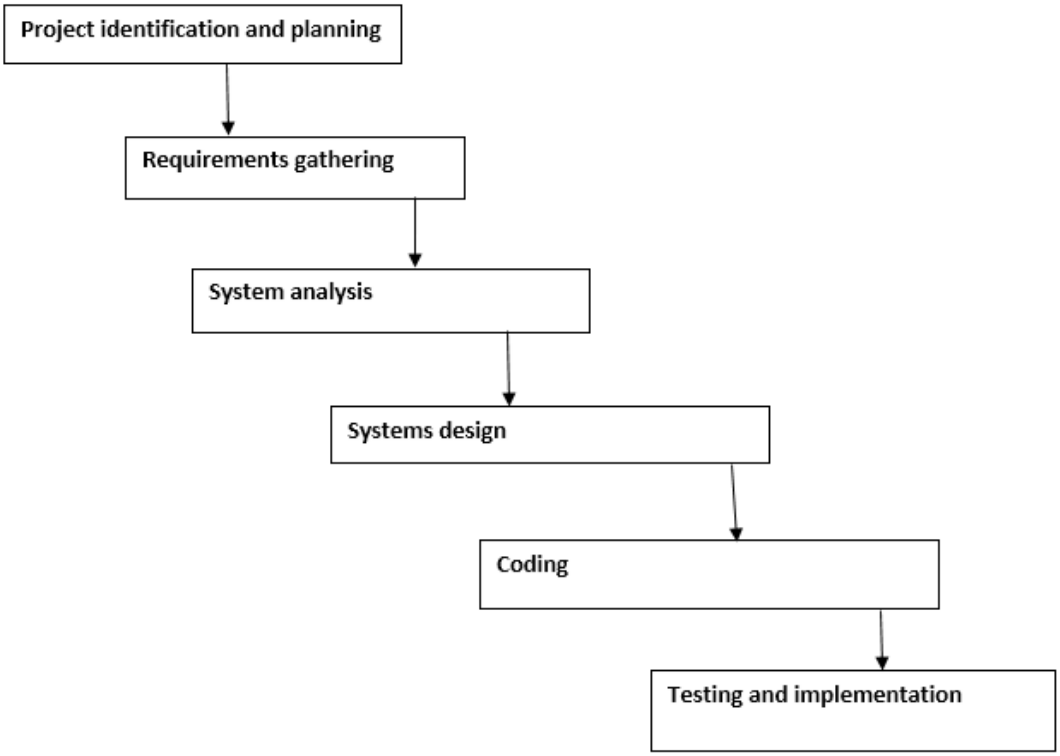
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 SYSTEM DEVELOPMENT LIFE CYLCE (SDLC)

SDLC is made of phases that are executed in a linear fashion. It is manageable and rigid. According to Kendall et al (2007) SDLC is concerned with the development process of information systems. It is a phased approach to information systems development, the major phases being project identification and planning, requirement gathering, systems analysis, systems design, testing and implementation

The following are the sequential phases in SDLC

Figure 2: Sequential phases in SDLC



Project identification and planning: This involves identification and selection of the project, project scope and feasibility study. The researcher identifies the problem that need a solution, assesses whether it can get a solution and the limits of the research. For the management to approve the project they must be convinced that it is bringing a solution that is pragmatic and the solution will address real issues in the company.

Requirement Gathering: At this stage all the requirements of the system are gathered. This can be done through interviews, questionnaires, observations, sampling data from the organization and analyzing it .The analyst tries to find out what the users need to perform their tasks. The people involved in this phase are operation managers, users, operation workers and analysts. All the possible requirements of the system are captured in this phase and documented in a requirement specification document.

System Analysis: At this phase the system requirements are analyzed. Data flow diagram is the tool used to show the input, processes and output of the business. A data dictionary is then

developed that gives a list of the items used and their specification .It is also at this stage that structured decision are analyzed. This is done using decision trees, structured English or decision tables which are the three major tools of analyzing structured decisions.

System Design: The physical and logical design are carried out at this phase. The physical design involves programming languages, database design, etc. used for implementation and the logical design involves devising the user interface, data models and specification of process. The analyst at this phase must design back up and controls to protect the data and the system. System design assists in defining overall system architecture.

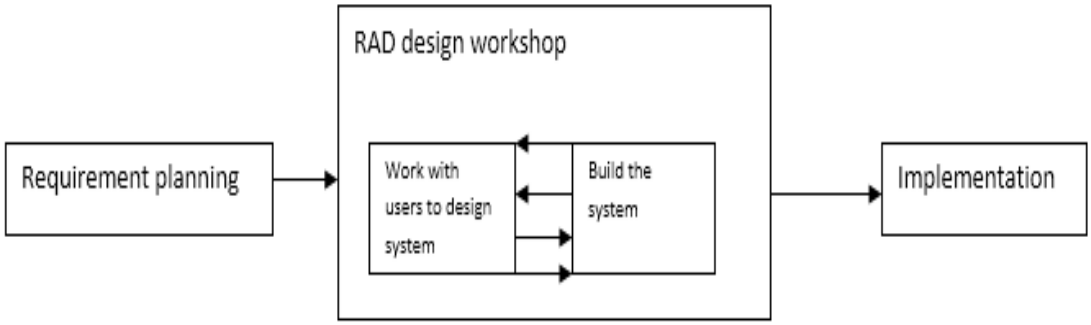
Coding: After the design phase the system is coded using the programmers preferred programming language. The language should also be appropriate for the project. The code should correspond to the blueprint available from the design phase. Documentation of the software is also done at this phase which should include a user manual and a help facility.

Testing and Implementation: Testing is done to remove any bugs that could be in the system and to verify that it meets user expectations. The small units that make up the system are tested individually, then integrated together and tested again. At this stage the users are trained on how to handle the system. There should be smooth transition from the old system to the new system. It is the work of the system analyst to make sure that happens at this stage. This can be done using strategies like parallel conversion, direct conversion, phased conversion or pilot conversion. All the system documentation should be completed at this phase and evaluation done. From this stage the system becomes operational.

3.2 RAPID APPLICATION DEVELOPMENT (RAD)

This is a combination of the software development tools and development method used. It is object-oriented based. Its goal is to shorten the time taken by the SDLC.RAD is made of three phases as shown below.

Figure 3: Rapid application development



Requirements planning phase: In this phase the analyst meets the user so that they can identify the objectives and the information requirements of the system. The main goal of this phase is to solve the business problem

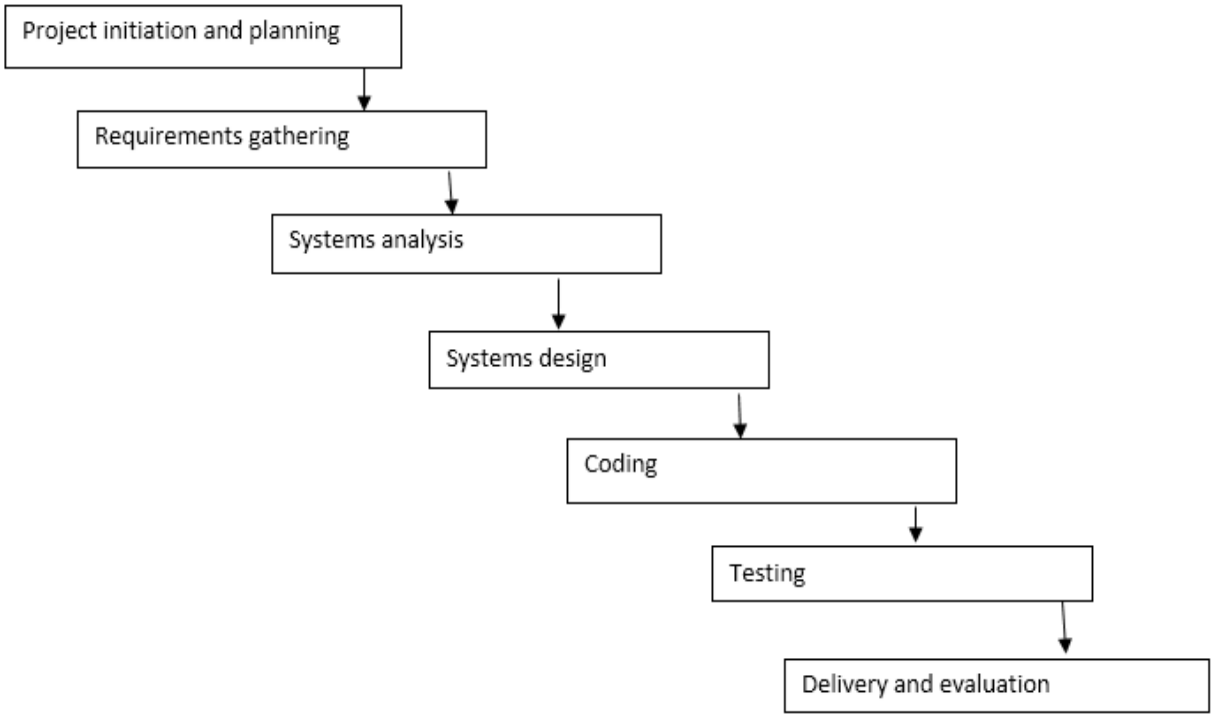
RAD Design workshop: This phase is tailored towards a workshop. It is hands-on and intense. Participants seat in around table where they can see one another each with a computer .During the workshop users comment on the running prototypes and analysts improve on the modules depending on how the users respond. Normally the workshops are very stimulating thus propelling the process of development.

Implementation phase: After developing the product, the next phase is to test it and roll it to operate. This happens at implementation phase. Since RAD can be used to develop new application where there were no existing ones, there is no need to run parallel conversion. Implementation is done using direct conversion.

3.3 STRUCTURED SYSTEMS ANALYSIS AND DESIGN METHODOLOGY (SSADM)

SSADM is a method of analyzing and designing information systems using systems approach. (Weaver et al, 1998). It strictly follows the waterfall method. The following are its phases:

Figure 4: phases structured systems analysis and design methodology (SSADM)



Project initiation and planning: The project is commenced at this stage and a strategic plan on how to undertake it drawn.

Requirement Gathering: Users give the analyst their expectations. The analyst gathers what is required to achieve the goal.

System Analysis: The current system is analyzed using dataflow diagrams.

System Design: Tables and their relationships are drawn. Normalization is done. It is advisable to normalize up to the third normal form.

Coding: The programmers code the system using a suitable programming language.

Testing and Implementation: The system is checked for errors. This can be user testing, stress resting, performance testing, etc**.**

Delivery and evaluation: The system is shipped to the respective company and evaluated to find out whether it meets the expectations.

According to Kendall et al. (2007) this methodology has the following advantages and disadvantages

Advantages

a) Technical and financial resources can be tapped to create the best possible method.

b) It can enable the movement of labour and project teams formation.

c) It can facilitate collaboration with industries by availing a framework for software development.

d) The systems written using this methodology can be maintained by most vendors.

e) Due to the availability of tools it can speed the development of software.

The following are the disadvantages

1. It requires that planning and strategy development be done before the project inception.

2. According to this model developers must get the firm requirements from the user which is not always possible because users may not be sure about the requirements at the beginning.

3. Since this model is rigid, it is difficult to change the requirements. This creates a poor relationship between the analyst and users.

3.4 EVALUATION METHODOLOGY

I evaluated the system using function points. Function points involves using complexity factors with different inputs, outputs and files. They are used to measure functionality. Functionality is used to show how much and what the product can do or perform.

According to Mathew (2009), Function points are used to determine the size of computer applications and the projects used to develop them. The size is determined either from a user point of view or a functional.

Function points were developed by Albrecht. Function Point Analysis (FPA), is the method used to determine the size of a software considering its function and is expressed in function points (Mathew 2009) .FPA didn't come because there was need of a new measure but because there was need to measure productivity which was becoming increasingly important.

Function Point Analysis is done using the following procedure:

i. Plan the count. I first determined the type of count and the boundaries. I identified the project development count, enhancement project count and also the project application count.

ii. Compute the Value Adjustment Factor (VAF).Here I assigned each feature function points per the guidelines of the international Function Points Users Group (IFPUG). I used the IFPUG's manual guidelines to compute VAF.

iii. Count data function types. Data functions could be either external interfaces files or internal logical files. I identified the main categories of data used in my system.

iv. Identify transaction function types. These are external queries, external inputs or external outputs. I based the complexity of each transaction on the number of data types it references.

v. Calculate the counts. Guided by the IFPUG manual I computed the counts.

vi. Verify the count. After computing the counts, I went through the system slowly reviewing the count to check for any errors or any omissions. I then made corrections on omissions done and corrected the errors.

The number of function points helped me estimate the project effort.

CHAPTER FOUR: SYSTEM ANALYSIS AND REQUIREMENT MODELLING

4.1 INTRODUCTION

At this stage the client and the developer agree on exactly what the problems are and what the new system is to do. If the developer has the wrong idea then all the subsequent work will be wrong and a waste of time.

4.2 CURRENT PHYSICAL MODEL

Facts rarely come up in an ordered fashion. Most system developers will find a mass of detailed, incomprehensible and sometimes conflicting information which has to be sorted out, organized and documented .The system developer must then discuss with the client to confirm that the developer has understood the problems and the requirements, resolve any conflicts and in case of any gaps fill them.

Sometimes a system administrator will not document the physical details, this depends on the circumstances: If the project is complicated with many interrelated procedures, or if the system

developer feels it is important to get the right detailed workings of the system, or if there are different users with many different and conflicting versions of how the system works. Normally users will respond well to this type of model because it shows the system as it currently operates, displaying the physical details that the users can recognize and relate to.

4.3 CURRENT LOGICAL MODEL

From the detail of how the existing system works, the developer needs to extract what the existing system does because the new system must incorporate most of the features, solve current known problems and meet any other client requirements. This model is known as current logical model.

4.4 DESCRIPTION OF THE EXISTING CIVIL REGISTRATION SYSTEM

The current civil registration system is paper based. People interested in acquiring birth and death certificates for their loved ones go to various registration offices in the country where their details are entered manually in forms by registration officers.

4.5 DATA FLOW DIAGRAMS (DFD)

A data flow diagram is a graphical representation of how information flows and is transformed as data moves from input to output. A DFD can be used to represent a software or system at any degree of abstraction. Data flow diagrams identify the system boundary, the external identities, the data stores, and the data or information flows into and out of the system. The data flow diagrams are process based.

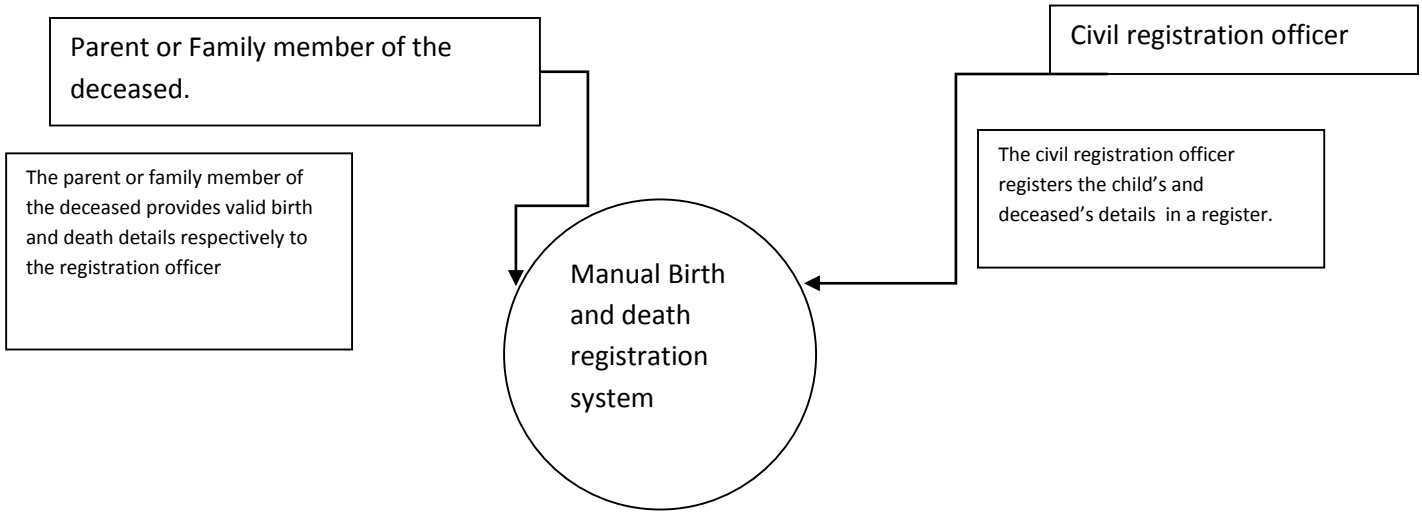
DFDs may be partitioned into levels that represent increasing information flow and functional detail. The top level diagram, level 0, is known as the context diagram. It is the highest level in a DFD and contains a single process which is a representation of the whole system. It models the whole system as a single process box whose sides represent the boundary of the system. By defining the boundary of the system, the context diagram delineates the area of study so as to

define areas of activity to be included and those which should not. In the context diagram all external entities are shown and also the major data flow to and from them. The context level DFD uses only three symbols: rectangle with rounded corners, a square with two shaded edges and an arrow. The context-level DFD has no data stores and therefore it is simple to create.

4.5.1 CONTEXT DIAGRAM FOR THE CURRENT SYSTEM

This is a generalized diagram and its main purpose is to assist the system analyst to understand the basic data flow. The context diagram consists of the Kenya's manual civil registration system, the person being registered and the registration officer. The registration officer is in charge of registration of births and deaths.

Figure 5: context diagram for the current system



4.5.2 LEVEL 1 DATA FLOW DIAGRAM (DFD) FOR THE CURRENT SYSTEM

The level one DFD comes from the context diagram. The context diagram is expanded to get the processes inside, data stores and new lower level data flows. Below is the level 1 DFD for the manual civil registration system.

4.6 A FLOWCHART FOR THE CURRENT SYSTEM

A flow chart is a diagram that shows the flow of data through the information processing systems. It represents an algorithm, process or workflow. The representation is in a diagrammatic form which is an illustration of the solution to the problem. A flowchart is used to provide people with common language or point of reference when working on a project. They use basic geometric symbols and arrows to show relationships.

4.7 UML DIAGRAMS

UML is a diagramming notation that is used to represent and discuss program designs. It is a language used to construct, visualize, specify and document the software system objects. It deals with particular set of objects and attributes. Object diagrams are used to visualize one instance at a time and the data that is in the system at that time. Below are some of the Unified Modeling Language diagrams that have been used.

4.7.1 ACTIVITY DIAGRAMS FOR THE CURRENT SYSTEM

An activity diagram is a graphical representation of workflow in a system. It can be used to show the workflow of any component in the system. The following UML diagram is for civil registration system.

4.7.2 USE CASE DIAGRAM FOR THE CURRENT SYSTEM

A Use case diagram shows the interaction between the user and the system.

4.7.3 COMPONENT DIAGRAM FOR CURRENT SYSTEM

A component diagram shows how small components interconnect to form large components which are more complex. The components communicate with one another through interfaces.

FACTS AND DATA GATHERING

A lot of secondary data was gotten from books, government reports, civil society reports and the internet.

4.8.1 INTERVIEWS

An interview is a talk between people where the interviewer asks the interviewee questions in order to extract certain information. In order to collect valuable information it is important to identify an expert in the domain of interest and prepare him/her before the time of interview. An interview should be conducted in a relaxed environment to get good results. When an interview is conducted correctly, it is the best method of collecting valuable data. In order to accomplish many objectives of a study it is important to interview people who are well conversed with the subject of the study. Interviews can be conducted face to face or electronically (online/telephonic) Three interviews were conducted in this study which were:

(i) Parents

(ii) Next of kin of deceased person

(iii) Registration officer

4.8.2 PURPOSE OF INTERVIEWS

The purpose of the interviews was to know the challenges people encounter during the registration process. The interview was also done to get suggestions from parents and next of kin of the deceased on what kind of system they would want in order to be served more efficiently, accurately, fast and effectively during the registration process.

4.8.3 SELECTION OF INTERVIEW SUBJECTS

In order to conduct the interview effectively it was necessary to select interviewee who could provide the best information. I interviewed several parents and those who had sought death certificates for their loved ones who had passed away

4.8.4 INTERVIEWING

The interviews were organized for a child's parent, next of kin of the deceased person and registration officer. The interviewee gave their convenient time and place. I briefed each interviewee about my study and gave them time to prepare. I interviewed each interviewee face to face and gave them time to respond. Time allocated for each of them was one hour. Additional time was added to interview sessions that took a longer time. The interviews were conducted on different days.

4.9 DISADVANTAGES OF THE EXISTING CIVIL REGISTRATION SYSTEM

The following are the disadvantages of the manual civil registration system:

1. It is expensive
2. There is a lot of delay in queuing

4.10 ADVANTAGES OF THE PROPOSED SYSTEM

1. The use of a computer is cheaper because paper work will not be required.
2. The system is highly accessible because of the availability of computers.
3. The civil registration system will reduce bribery for one to be served due to its electronic nature.

4.11 REQUIRED LOGICAL MODEL

The requirement modeling stage moves from the logic of the current system to required system. The objective is to spell-out what needs to be done to meet the requirements in the problem

definition and how to solve them. The end product of this stage is a model of the required system and the specification of requirements outlining what the system is supposed to do but not how it will be implemented.

4.12 CONCLUSION

The proposed civil registration system is easy to use and learn. Information stored will be safe and secure. The system uses computers that will highly reduce operational costs during the registration process. The Kenyan Government should implement the system to ensure birth and death registration system is fast and efficient.

CHAPTER 5: SYSTEM DESIGN

5.1 INTRODUCTION

Design is the process of applying various principles and techniques in order to define a process or a system in adequate detail for it to be physically realized. There are certain items such as modules, relationship among modules, data structures, relationship between the data structures and algorithms for implementation that must be designed in this phase. During system development, design is the first step into the development phase.

The design stage is expected to deliver outlines of different technical answers that meet the expectations of system analysis and requirement modeling stage.

These solutions include:

1. A minimum-cost solution. This just does the job and nothing more.

2. A medium –cost solution. This is convenient to users and does the job well. It may have additional features which the client did not ask for but the developer thinks they will be needed from experience.

3. A high- cost solution. This includes anything that the client needs.

In our design phase we did the following:

1. Organized the system into modules

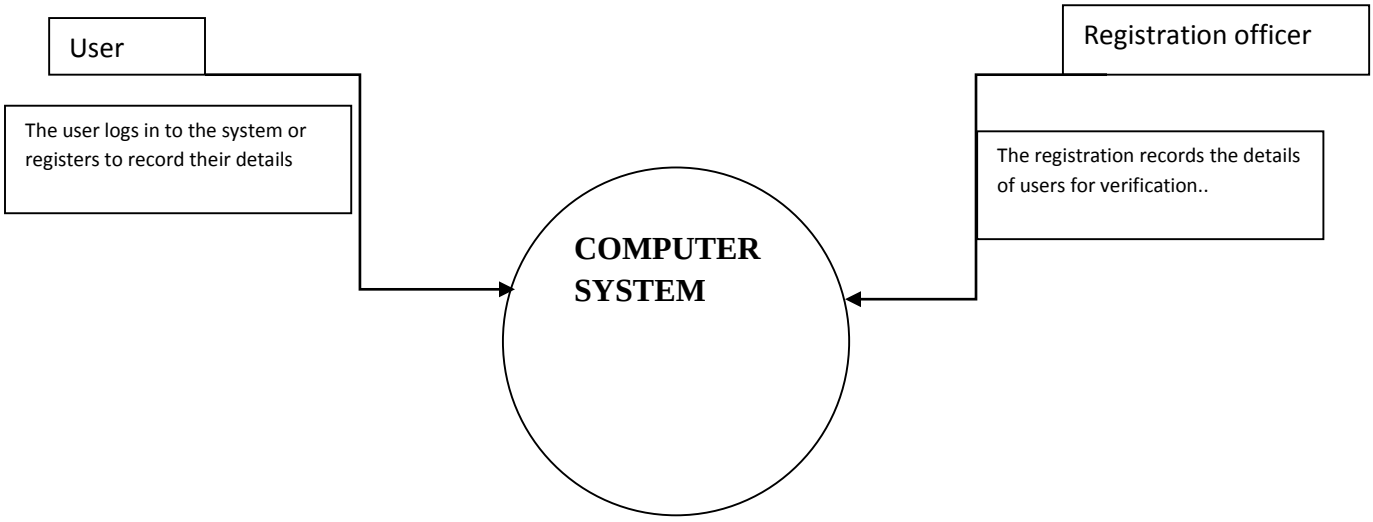
2. Allocated tasks to processors
3. Choose an approach to manage data store
4. Handled access to global resources
5. Choose implemented logic

5.2 DATA FLOW DIAGRAM

5.2.1 CONTEXT DIAGRAM FOR THE PROPOSED SYSTEM

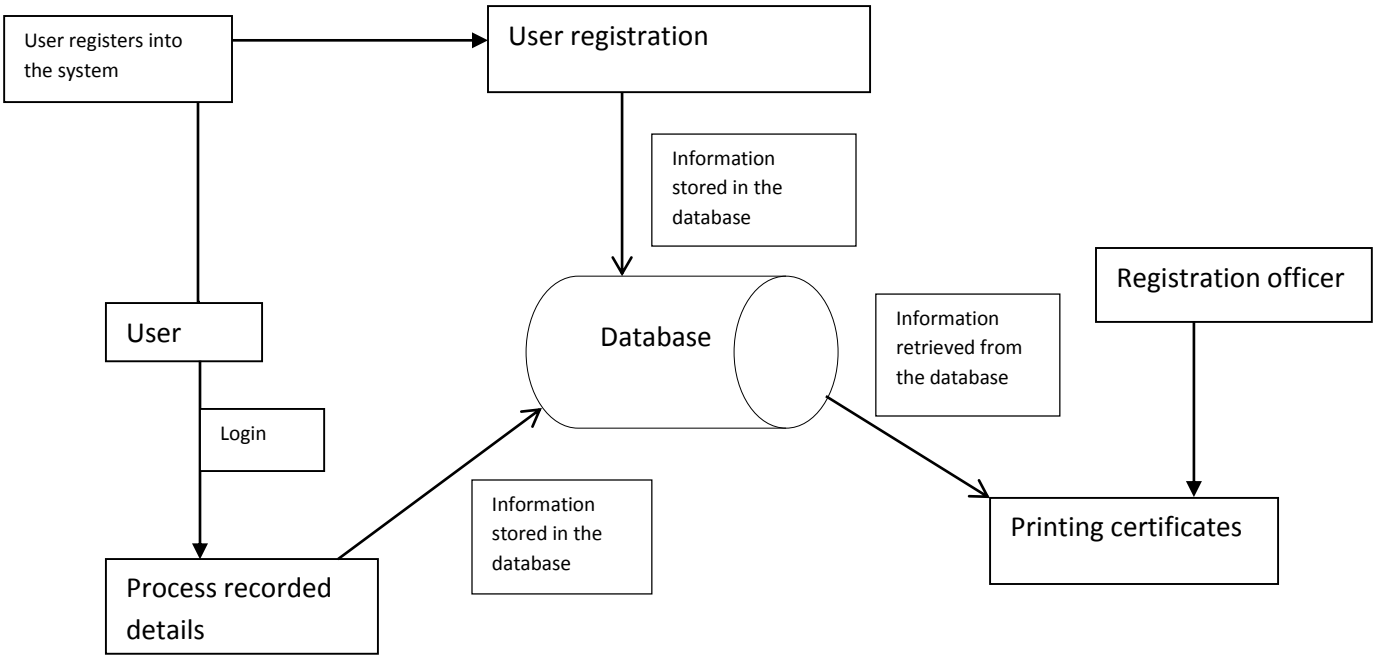
A context diagram is a data flow diagram that subsumes everything inside the scope of the system. It should just be an overview basically showing how the system will receive and send information to the entities external to the system. It includes inputs, the system in general and outputs. It is a bird's eye view of the data movement and widest conceptualization possible of the system. It answers the question, 'who needs to use this system?'

Figure 6: Context diagram for the proposed system



5.2.2 LEVEL 1 DATA FLOW DIAGRAM FOR THE PROPOSED SYSTEM

Figure 7: Level 1 data flow diagram for the proposed system



5.3 FLOW CHART FOR THE PROPOSED SYSTEM

A flow chart is a diagram that represents a process or an algorithm. The steps are represented by boxes connected using arrows.

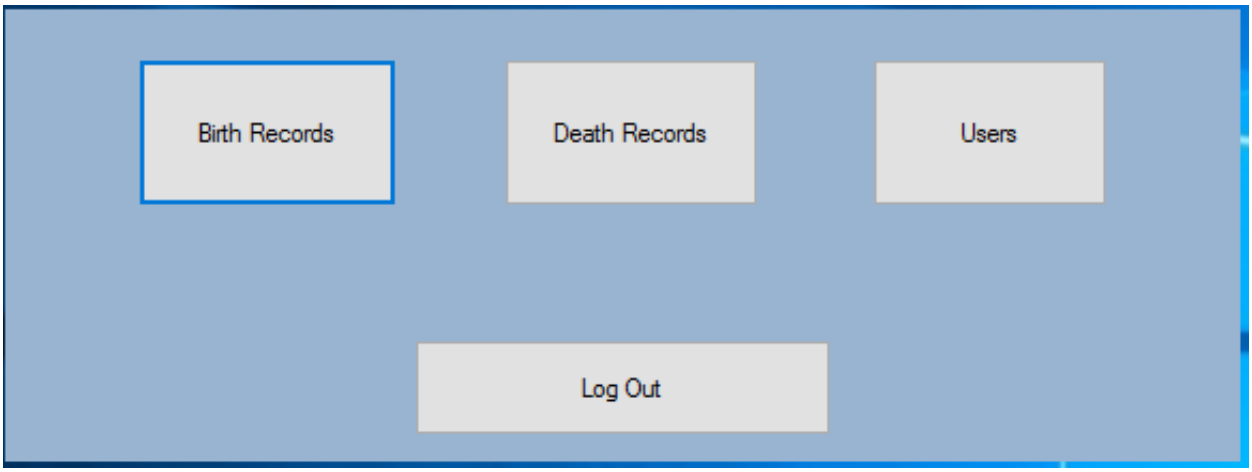
5.4 UNIFIED MODELING LANGUAGE (UML) DIAGRAMS FOR THE PROPOSED SYSTEM.

5.4.1 CLASS DIAGRAM FOR THE PROPOSED SYSTEM

This is the major building block of object oriented modeling. It is a description of different types of objects exiting in the system and the types of static relationships among them. It summarizes the target system.

5.10 INTERFACE DESIGN

Figure 8: system user interface



5.11 INPUT DESIGN

This shows how the forms have been designed for entry of data by the user of the system. The system has the user and the system administrator login panel

Figure 9:Administrator interface

Figure 10: Birth Form

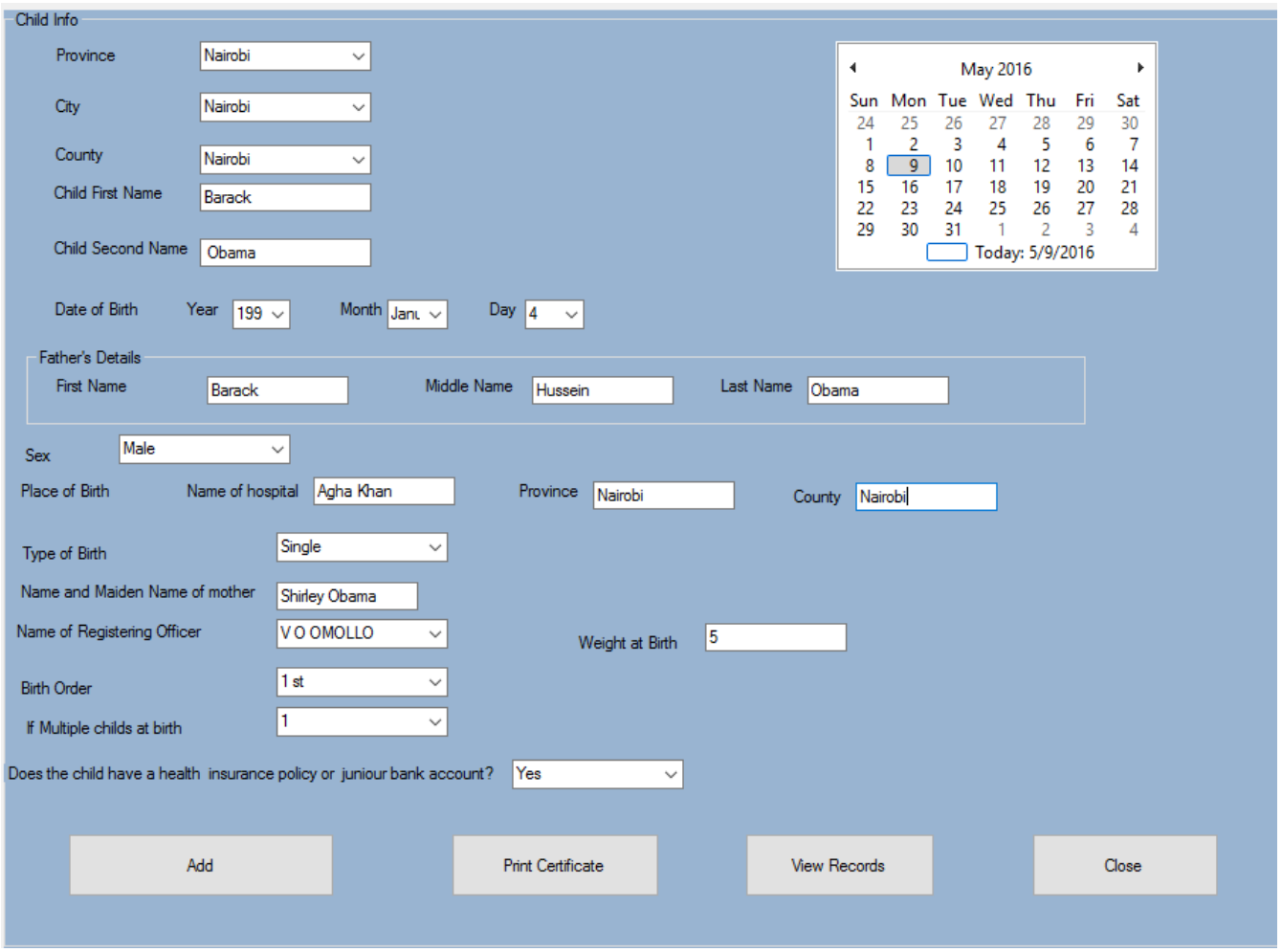
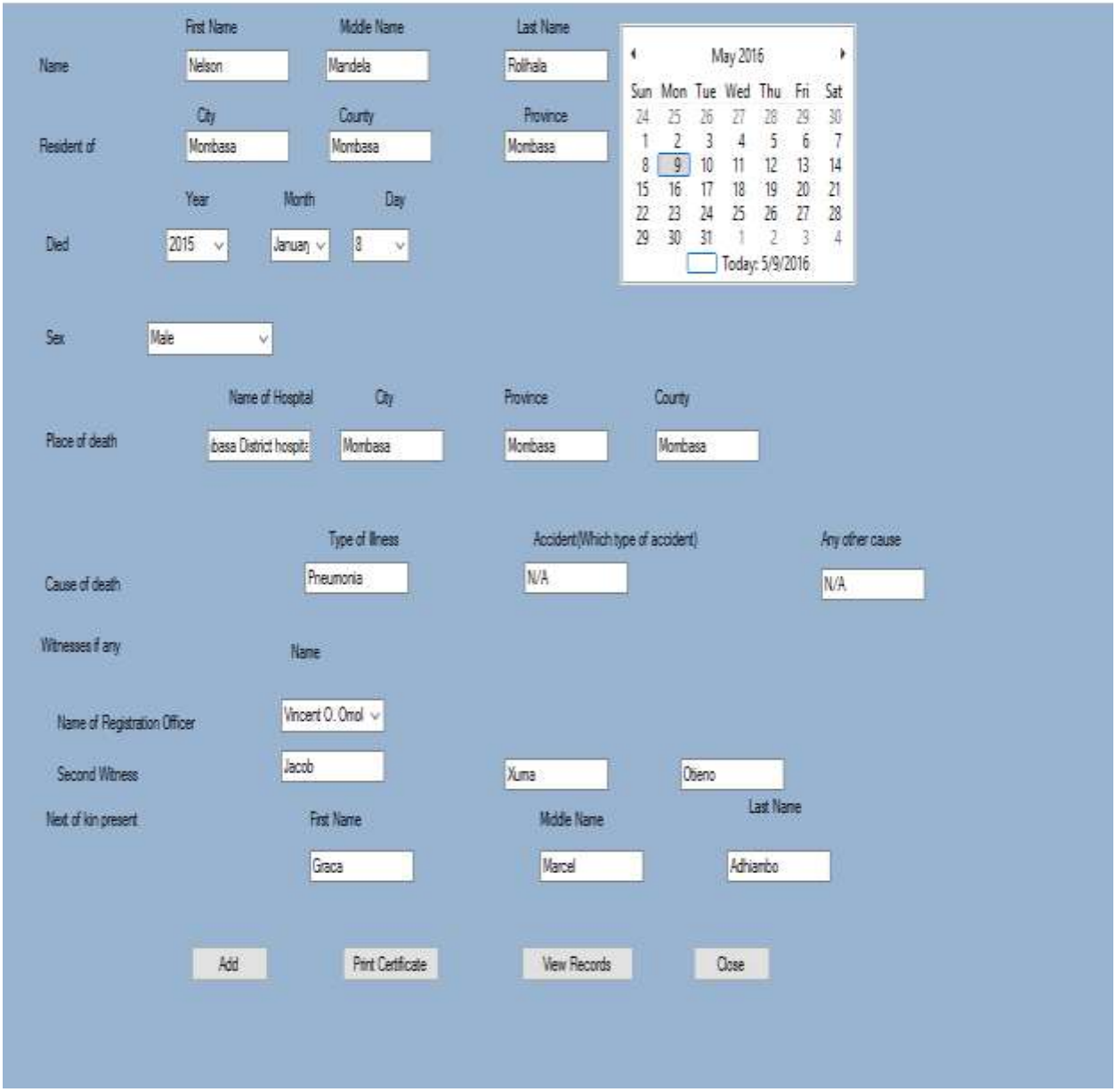

Child Info
Province
Nairobi
City
Nairobi
County
Nairobi
Child First Name
Barack
Child Second Name
Obama
May 2016
Sun Mon Tue Wed Thu Fri Sat
24 25 26 27 28 29 30
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31 1 2 3 4
Today: 5/9/2016
Date of Birth
Year
199
Month
Jani
Day
4
Father's Details
First Name
Barack
Middle Name
Hussein
Last Name
Obama
Sex
Male
Place of Birth
Name of hospital
Agha Khan
Province
Nairobi
County
Nairobi
Type of Birth
Single
Name and Maiden Name of mother
Shirley Obama
Name of Registering Officer
V O OMOLLO
Weight at Birth
5
Birth Order
1 st
If Multiple childs at birth
1
Does the child have a health insurance policy or juniour bank account?
Yes
Add
Print Certificate
View Records
Close

Figure 11:Death Form



5.12 OUTPUT DESIGN

There are several objectives that the system analyst tries to attain when designing an output (kendall et al., 2007).These objectives are as follows:

i. Designing output to serve a specific purpose.
ii. Making output meaningful to the user.
iii. Producing the required output.
iv. Providing appropriate output distribution.
v. Delivering the outline before deadlines.
vi. Selecting the most effective way of delivering the ouput.

Figure 12: Birth certificate report

REPUBLIC OF KENYA

H (No 045557

CERTIFICATE OF BIRTH

Birth in the	Nyeri		District in the	Central	Province	Central	
Entry No	32014	Where Born	Nairobi	Name	James		Kiptorich
ate of Birth	February1	Sex	MALE	Name and Surname of Father	JOHN	SETH	BARAZA
		Janet Njau					
Name and Maiden Name of Mother							
Name and Description of Informant							
ame of Registering ficer	V O OMOLLO			Date of Registration	February	1	

I ..... District/Assistant

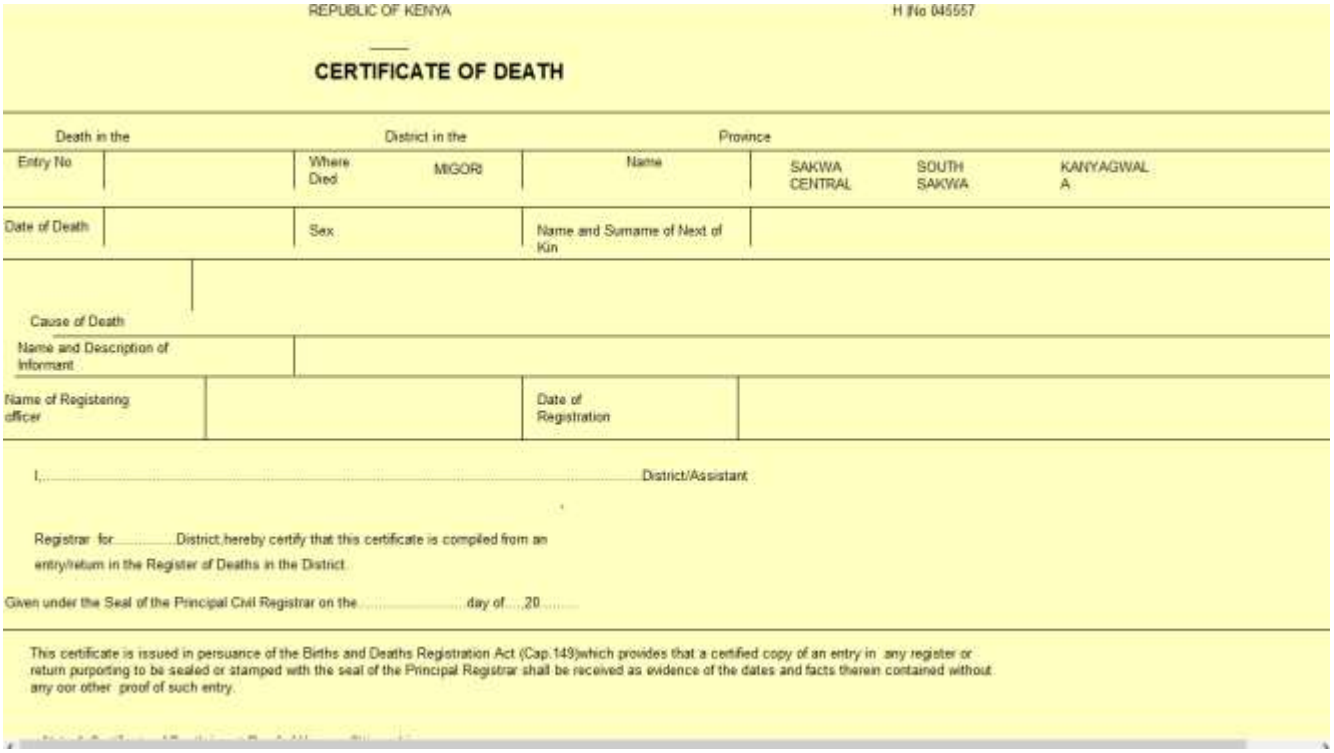
Registrar for ..... District,hereby certify that this certificate is compiled from an entry/return in the Register of Births in the District.

iven under the Seal of the Principal Civil Registrar on the ..... day of ....20 .....

This certificate is issued in persuance of the Births and Deaths Registration Act (Cap 149)which provides that a certified copy of an entry in any register or return purporting to be sealed or stamped with the seal of the Principal Registrar shall be received as evidence of the dates and facts therein contained without any oor other proof of such entry

Figure 13: Death certificate report

5



REPUBLIC OF KENYA

H /No 045557

CERTIFICATE OF DEATH

Death in the		District in the		Province		
Entry No		Where Died	MIGORI	Name	SAKWA CENTRAL	SOUTH SAKWA	KANYAGWALA
Date of Death		Sex		Name and Surname of Next of Kin		
Cause of Death						
Name and Description of Informant						
Name of Registering officer		Date of Registration				

I,.....District/Assistant

Registrar for.....District,hereby certify that this certificate is compiled from an entry/return in the Register of Deaths in the District.

Given under the Seal of the Principal Civil Registrar on the.....day of....20.....

This certificate is issued in persuance of the Births and Deaths Registration Act (Cap.149)which provides that a certified copy of an entry in any register or return purporting to be sealed or stamped with the seal of the Principal Registrar shall be received as evidence of the dates and facts therein contained without any oor other proof of such entry.

CHAPTER SIX: IMPLEMENTATION OF THE SYSTEM

This is the stage where different modules of the software are coded and integrated together. In this chapter testing of the system and the changeover are discussed. The different methods of testing that were carried are discussed in depth and how the system is expected to be implemented. Reasons are also given for the method of changeover adopted.

The chapter explains how users navigate through the system in order to use it easily and effectively.

6.1 FORM INPUT DESIGN

The users interact with this system through visual studio display area.

6.2 TOOLS USED FOR CODING

The system is running on the computer.

The database used was Microsoft Access

6.4 TRAINING USERS

After building the system it is important to train the users of the system. The first step involves identifying whom to train. I shall train Registration Officers on the use of Civil registration system.

To train the registration officers we shall develop objectives. The objectives in this case are to have the registration officers use the system effectively and efficiently with minimum effort.

6.5 PROPOSED CHANGEOVER

We intend to use parallel conversion for a changeover. In this strategy we run the old system together with the new system at the same time. Since manual civil registration system has been in use for a long time, it will take some time before people build confidence in the system. We will run the manual system at the same time with the new civil registration system.

CHAPTER SEVEN: LIMITATIONS, CONCLUSIONS AND RECOMMENDATIONS

7.1 LIMITATIONS OF THE SYSTEM

Civil registration system has the following challenges.

i. The government of Kenya does not have enough money to implement the system in full.
ii. The system implementation will lead to loss of jobs to many people in the paper based system.

iii. Over 60 percent of the country does not have power and since the system uses power, lack of power will become a hindrance to its implementation.

iv. Incase users enter the wrong information then the results will also be wrong.

v. Many people do not have access to computers.

7.2 CONCLUSION AND FUTURE WORK

The objective of this research was to invent an electronic system to aid in faster and efficient registration of birth and deaths of people in Kenya .The System runs in any windows operating system and uses Microsoft Access database.

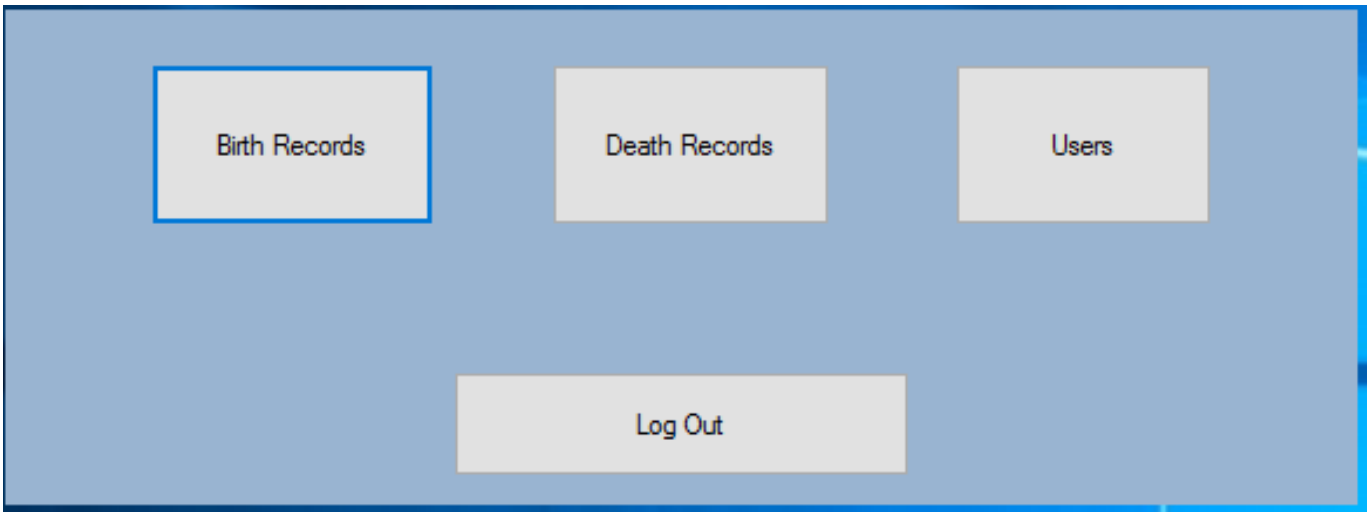
7.3 RECOMMENDATIONS

i. The Kenya government should embrace electronic civil registration system to ensure that registration is faster and efficient.

ii. The government should go ahead and improve user accessibility to computers in all parts of the country.

APPENDIX 1: USER MANUAL

(i) User interface



The main interface has

(i) Birth records button-This directs the user to the form where birth details are entered

(ii) Death records button- This directs the user to the form where death details are entered

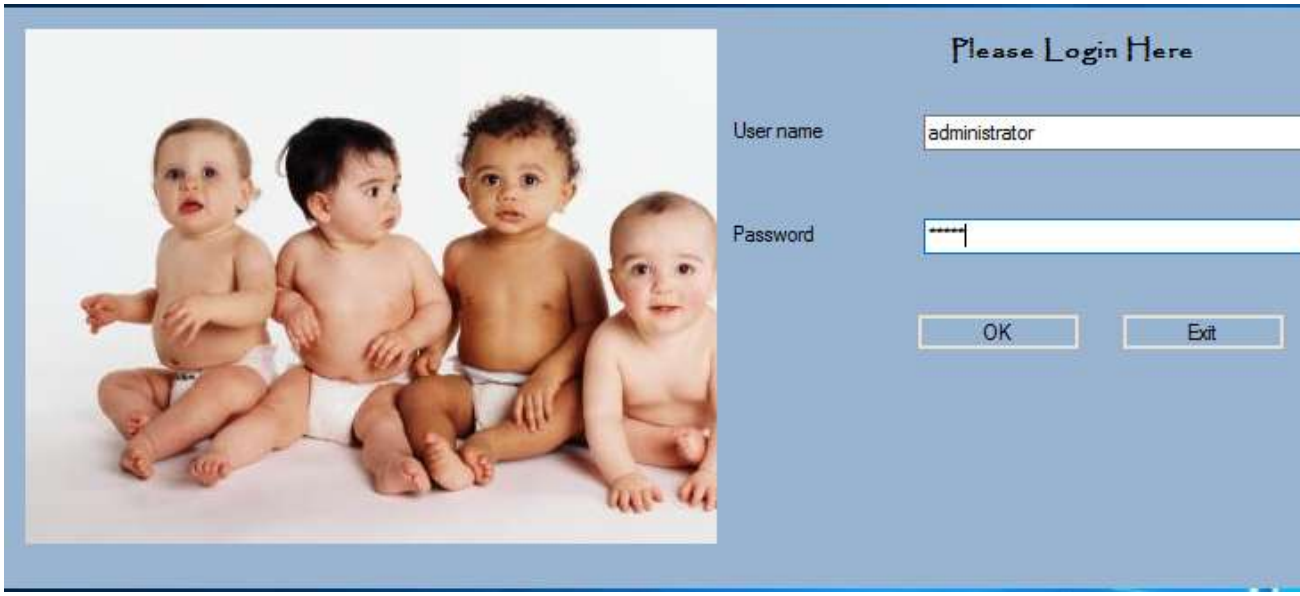
(iii) User's button-This is where a user is added, passwords changed and users deleted.

(iv) The Logout button-This is used for logging out of the session to allow other users to register.

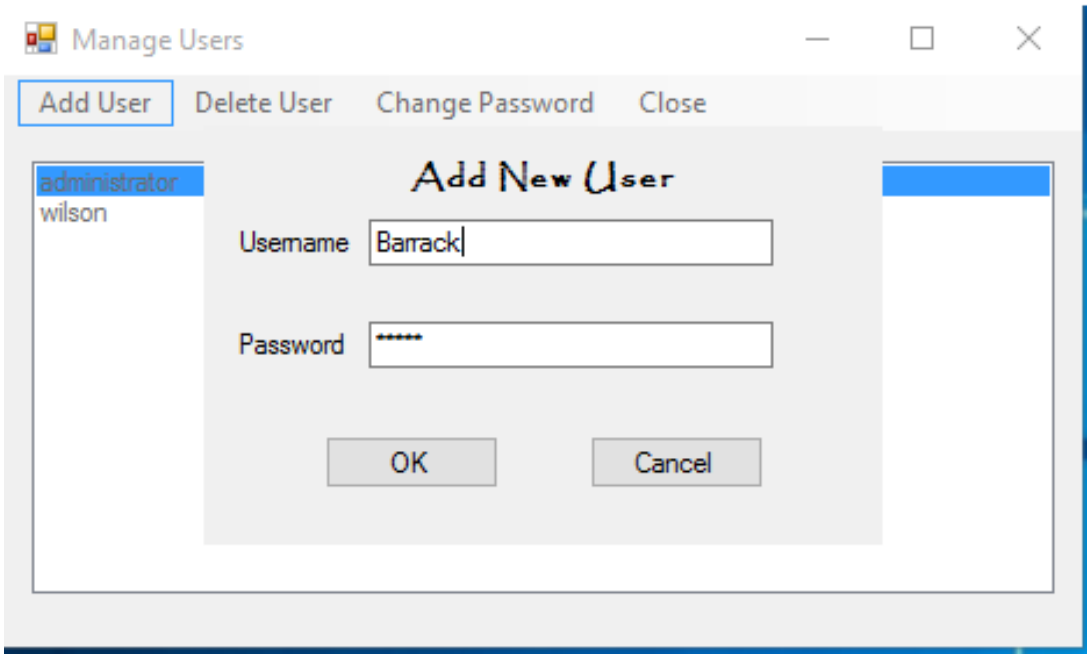
The administrator logs in and registers a registration officer who registers other users.

Figure 14: Administrator Registration

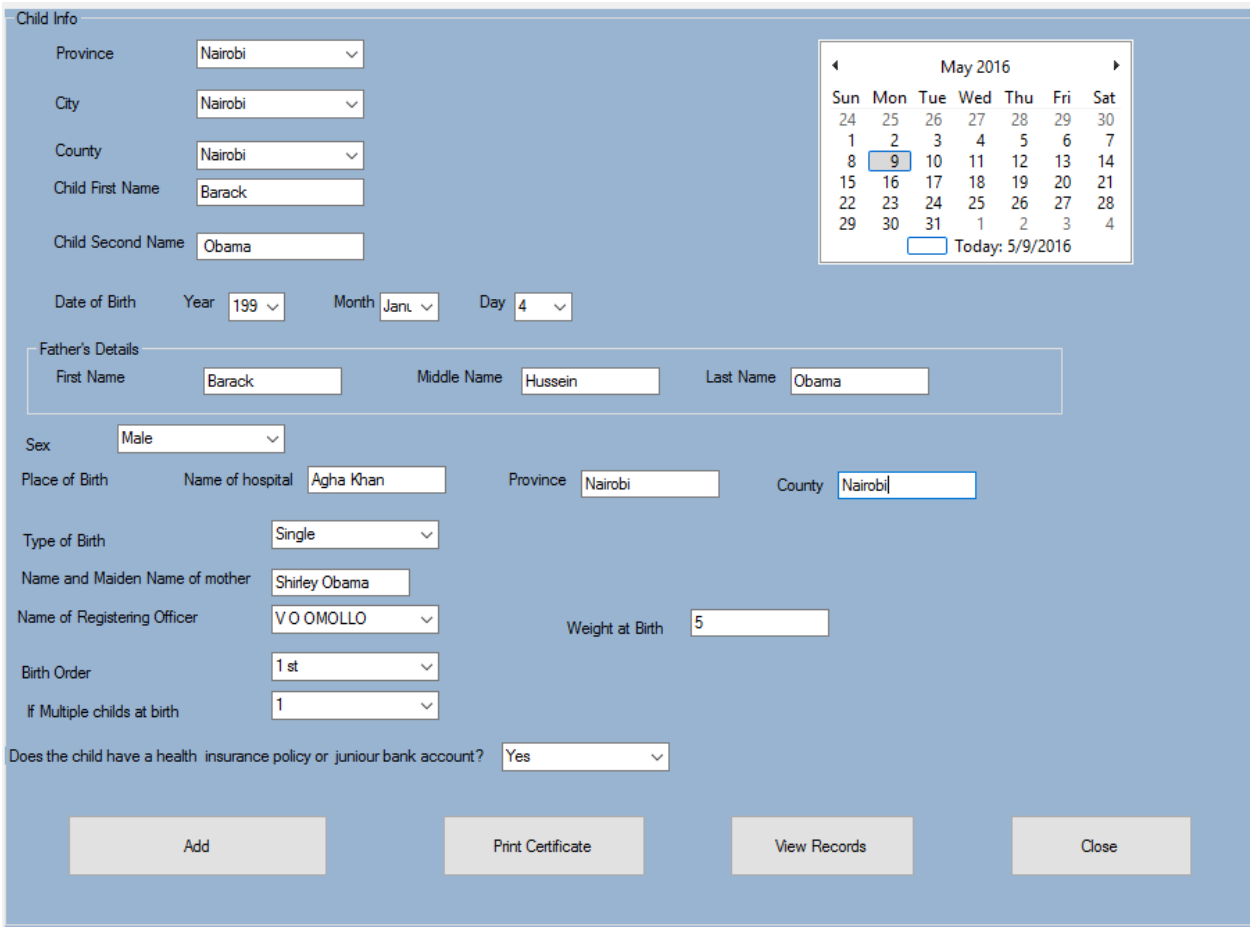
(ii) The administrator registers a Registration officer



(iii) The registration officer logs into the system to add a user



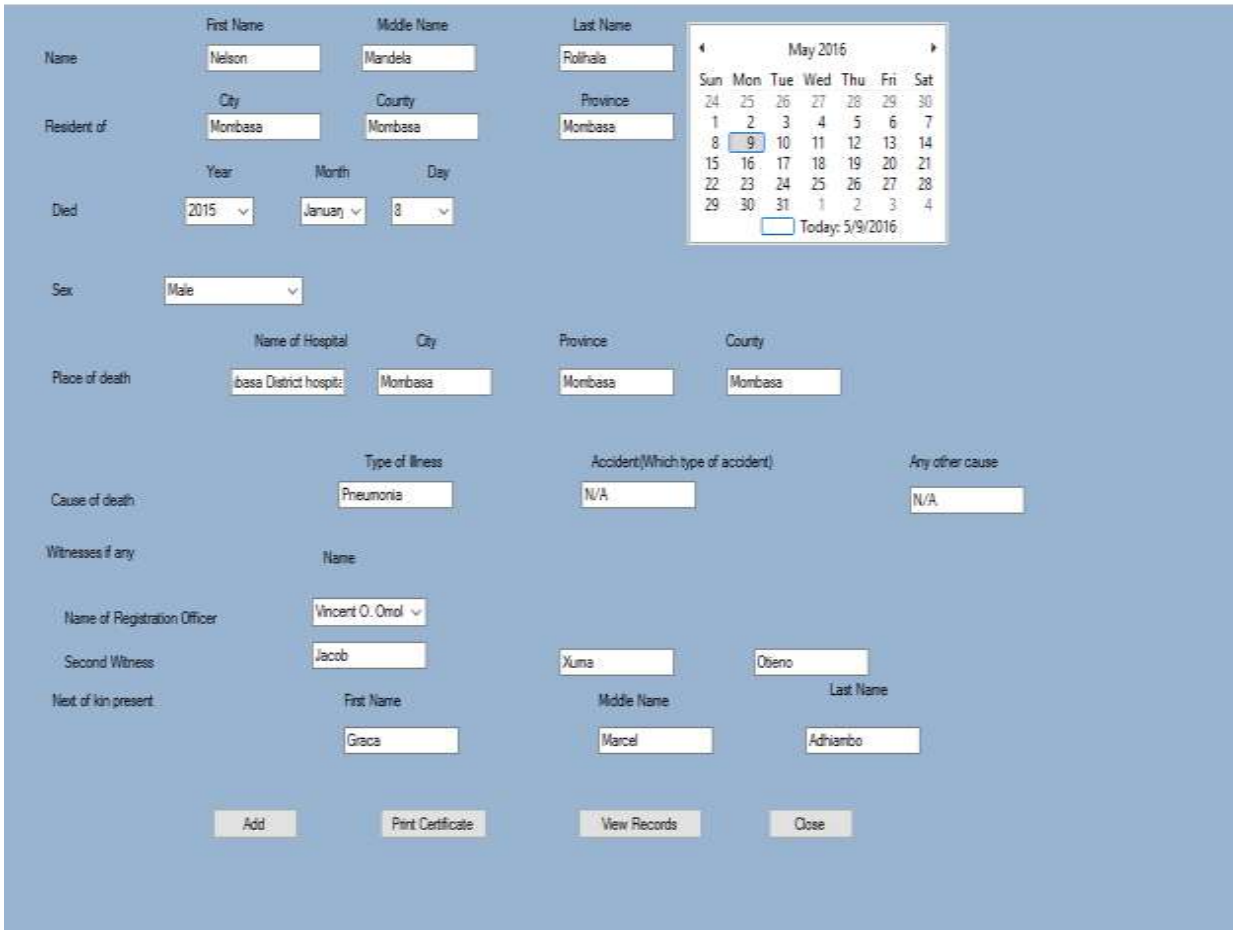
(iv) Birth Form



This form has the following buttons:

i. Add button-To add birth registration details to the database.
ii. Print button-To print a birth certificate from the records.
iii. View button-To view records in a grid view table format
iv. Close button-To close the birth form.

v. Death registration Form



It has the following buttons:

i. Add button-To add death registration details to the database.
ii. Print button-To print a death certificate from the records.
iii. View button-To view death records in a grid view table format
iv. Close button-To close the death form.

APPENDIX 2: SAMPLE CODE

SAMPLE CODE FOR HOME PAGE

```
Public Class Form7

    Private Sub Button2_Click(sender As Object, e As EventArgs) Handles Button2.Click
        Me.Hide()
        Form6.Show()
    End Sub

    Private Sub Button3_Click(sender As Object, e As EventArgs) Handles Button3.Click
        Me.Hide()
        Form4.Show()
    End Sub

    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        Me.Hide()
        Form2.Show()
    End Sub

    Private Sub Button4_Click(sender As Object, e As EventArgs) Handles Button4.Click
        Me.Hide()
        Form8.Show()
    End Sub
End Class
```

SAMPLE CODE FOR CONNECTING TO THE DATABASE

```
Try
    ChildinfoTableAdapter1.InsertQuery(city.Text, county.Text, prov.Text, child_fname.Text, child_sname.Text, firstname.Text, middlename.Text, la
    MessageBox.Show("Record Added!")
Catch ex As Exception
    MessageBox.Show("Problem occurred while adding the record.")
End Try
```

SAMPLE CODE FOR LOGIN

```
Public Class Form4

    Private Sub OK_Click(sender As Object, e As EventArgs) Handles OK.Click
        If (UsernameTextBox.Text = "" Or PasswordTextBox.Text = "") Then
            MessageBox.Show("Please enter Username and/or Password!")
        Else
            If (LoginTableAdapter1.Login(UsernameTextBox.Text, PasswordTextBox.Text) = 1) Then
                Me.Hide()
                Form7.Show()
            Else
                MessageBox.Show("Login failed. Wrong Username and/or Password combination!")
            End If
            UsernameTextBox.Clear()
            PasswordTextBox.Clear()
        End If
    End Sub

    Private Sub Cancel_Click(sender As Object, e As EventArgs) Handles Cancel.Click
        Me.Close()
    End Sub
End Class
```

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