

**IMPLEMENTATION OF AN ONLINE BIRTHS AND DEATHS
REGISTRATION SYSTEM
CASE STUDY: UGANDA REGISTRATION SERVICES BUREAU**

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DECLARATION

This Project Report is original and has not been submitted or published previously for any other Degree or Diploma Award to any other University before.

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APPROVAL

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DEDICATION

To my sister Ms Komugisha Claire who facilitated me all through unconditionally plus my parents Mr. and Mrs. Kachope Robert and to all my family members for the love and care.

I cherish u all. Please keep up the spirit. May God bless u. *Kachope Emmanuel*

To my dear parents Mr and Mrs Onyango who have supported me financially and giving me the guidance throughout my stay at the university, my brothers and sisters for their assistance in various ways, and finally to the almighty God who has blessed me abundantly. *John Haggai Onyango*

ACKNOWLEDGEMENT

We take this opportunity to thank God who was always with us and also provided the knowledge, wisdom and skills that have enabled us to complete this project.

We would like to extend our sincere gratitude to our supervisor, Ms Kasuubo Esther for sparing time and effort to offer extraordinary assistance, advice and support through this great undertaking. Thank you so much!

Emmanuel Kachope and John Haggai Onyango

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LIST OF ABBREVIATIONS

1. **ICT** - Information and Communication Technology
2. **IT** - Information technology
3. **ZPG** - Zero Population growth
4. **RMS** - Record Management System
5. **ISO** - International Standards Organization
6. **DBMS** - Database Management System
7. **EERDs** - Enhanced Entity Relationship Diagrams
8. **DFDs** - Data Flow Diagrams
9. **HTML** - Hyper text markup language
10. **CSS** - Cascading style Sheets
11. **SQL** - Structured Query Language

ABSTRACT

For over half a century, Population Studies have reported significant advances in methods of demographic analysis, conceptual and mathematical theories of demographic dynamics and behaviour, and the use of these theories and methods to extend scientific knowledge and to inform policy and practice.

Today developing countries Uganda inclusive have been facing problems in birth and death certificates processing and their records management which has always resulted from excessive corruption, poor security, inappropriate records management criteria and forgery especially by aging government employees who are always struggling to secure their job positions before retiring.

In Uganda the same problem has been experienced in the government employees who utilize the weaknesses in the current manual way of document handling, to keep on falsifying about their true age in the office of the registrar general. This has been as a result of the registrar general's office failure to embrace information technology to help them redesign their business processes by automating some of their operation procedures.

Most low developing countries are facing a number of problems in birth and death certificates processing and production these include; bureaucracy, bribery, corruption, forgery, security and poor records management which is currently done manually. This makes the processing of documents slow and more hectic. Therefore the government of Uganda needs to come up with an automated birth and death certificates records management system to help reduce these problems through embracing information and communication technology (ICT).

Therefore there is need to carry out research so as to come out with a secure and a more effective automated system to streamline some business processes such as registration and applications to improve efficiency, enhance planning and decision making.

The an Automated Online Births and Deaths Records Management System is an Information System that serves to capture, store, retrieve and disseminate information about both births and deaths, process certificates and records management in the office of the administrator general of Uganda. It offers a means of information sharing as well as automating the existing manually driven record keeping facility.

CHAPTER ONE

INTRODUCTION

1.0 General Introduction

Registration is a vital process undertaken by Governments around the world in order to know the status of their populations and also to further plan for the utility of resources. When babies are born records are kept at respective hospitals in the form of birth certificates for further use such as carrying out a census every decade to know the population status.

In terms of Government planning for the resources it is vital in that they can plan resources according to the amount of people that are there in a particular country e.g. food, water, education are all major factors for a government as they need to estimate how much of a resource they need to cater for the population. Death certificates are equally important in this aspect as they also help in determining a population status for a government.

One way of trying to solve this problem here in Uganda is by enacting an online registration system which helps to register births and deaths across the country. This in itself helps in solving a number of problems such as bribery, bureaucracy, corruption, forgery, security and poor records management of which is currently done manually. This makes the processing of documents slow and more hectic.

In Uganda the Organization responsible for carrying out this process is the Uganda registration services bureau. The Organization was established in October 1998.

1.1 Background

In Uganda the problem of manual registration has been solved by the introduction of online registration which counters weaknesses involving document handling as people falsify their details. Therefore the government of Uganda through the Uganda registration services bureau has come up with an automated birth and death certificates records management system.

The bureau was created to take over the functions of the Registrar General's Office under the Ministry of Justice and Constitutional Affairs. The Act came into force on the 16th of August, 2004 and the self Accounting status was granted in July, 2010. The bureau is governed by the Board of Directors and the Chief Executive Officer is the Registrar General.

1.2 Problem statement

Most low developing countries are facing a number of problems in birth and death certificates processing and these include; bureaucracy, bribery, corruption, forgery, security and poor records management. This makes the processing of documents slow and more hectic hence the government of Uganda needs to come up with an automated birth and death certificates records management system to help reduce these problems through embracing Information and Communication Technology (ICT).

Therefore there is need to carry out research so as to come out with a secure and a more effective automated system to streamline some business processes such as registration and applications to improve efficiency, enhance planning and decision making.

1.3 Objectives

1.3.0 Main Objective

To design and implement an online Births and Deaths Records Management System.

1.3.1 Specific Objectives

- a) To design a web based database to efficiently manage births and deaths processing in Uganda
- b) To design and implement a database system
- c) Test and validate the system

1.3.2 Research Questions

1. How can one design a web based database that can efficiently manage births and deaths processing in Uganda?
2. How can one implement an online database system to manage births and deaths processing?
3. How can one test and validate an online database system?

1.4 Scope

This project focuses on the development of an online births and deaths records management system. The system will serve to make information and other computer based resources available to all the clients, improve planning and decision making in the office of the registrar general of Uganda.

1.5 Significance of study

The online births and deaths registration system aims to reduce the delays in the processing of death and birth certificates in Uganda. The practical uses of the system are discussed below:

- The system solves the archived-records dilemma where pre-existing birth and death certificates records are in paper form. An electronic record in this case will create a viable solution in storing both archived and active records in a centralized database. The system is cost-effective and technologically-viable alternative to manually paper-based record keeping.

- It efficiently reduces documentation time, and confidently translate into better service delivery system, paper work is minimized by an electronic system.
- It improves on information management of records at the Registrar General through setting up an Integrated Information Management System.
- It makes information retrieval easy for the staff and provides a backup in case of data loss.
- It eliminates data redundancy and improves on protection of confidential information.
- It makes easy generation of reports such as birth and death certificate reports hence increasing on the accuracy and efficiency. It adds on the existing literature which enriches the field of academics and may be adopted to design more systems.

1.6 Limitations

(i) **Time:** Time was a big constraint for this project trying to meet deadlines was not easy as changes to the project had to be made at various times.

ii) **Software:** Software plays a big factor in the final outcome of the project therefore getting the right ones was vital and also incorporating them into the project.

iii) **Availability of personnel:** Getting held of employees to ask questions about the Organization was next to impossible at times.

(iv) **Finance:** Getting the finances for transport to meet up for discussions was abit

of a challenge.

1.7 Conceptual framework

Architectural Framework for the proposed system

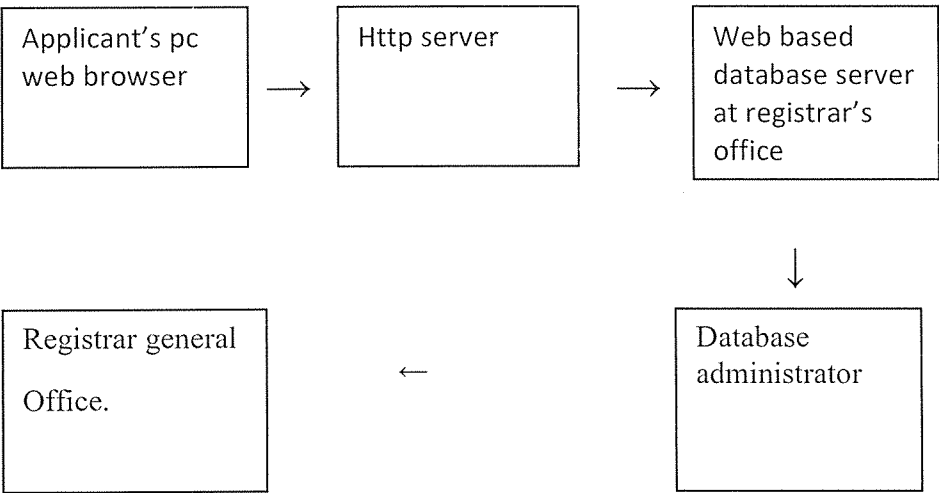


Figure 1.1 conceptual diagram

The proposed system has an architectural framework which shows how the system works. The system will start with the applicant applying for a birth or death certificate therefore one will do this whereby data flows through a web browser which then passes the http server which then routes the data to the web based database server at the Uganda registration services bureau. From here the database administrator will then get the data update it and pass it on the office of the registrar general to put up certificates online from which the applicant accesses ones certificate.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

A literature review is account of what has been published on a topic by accredited scholars and researchers. The purpose is to convey to the reader what knowledge and ideas have been established for a particular topic and what their strengths and weaknesses are.

The automated online death and birth certificates records management system is an Information System that will serve to capture, store, retrieve and disseminate information about both birth and death certificates, records management in the office of the administrator general of Uganda. Information Technology is defined by (Laudon, 2002), as any form of technology comprising of mainly hardware and software used by people to handle information. Information technology is any technology that powers or enables storage, processing and information flow within an organization. Anything involved with computers, software, networks, intranets, web sites, servers, databases and telecommunications falls under the IT umbrella. Citing that most modern businesses depend heavily on information systems; from employee e-mail to database management, to e-commerce web sites, to Hospitals that have large patient databases to maintain, and Universities which have sprawling networks to administer. The use of information technology in the provision of birth and death certificates has advantages such as: leading to error reduction, improving communication, record keeping and enhancing efficiency in the services offered by the office of the administrator general through endorsing information technology which is the only source of success in today's business. In the past two decades, Information Technology (IT) has revolutionized virtually every facet of people's everyday lives. Organizations of all types have long seen that Information Technology—viewed comprehensively and deployed effectively; can replace old challenges with new possibilities. For over half a century, Population Studies has reported significant advances in methods of demographic analysis, conceptual and mathematical theories of demographic dynamics and

behaviour, and the use of these theories and methods to extend scientific knowledge and to inform policy and practice.

The Journal's coverage of this field is comprehensive: applications in developed and developing countries; historical and contemporary studies; quantitative and qualitative studies; analytical essays and reviews. The subjects of papers range from classical concerns, such as the determinants and consequences of population change, to such topics as family demography and evolutionary and genetic influences on demographic behaviour. (Francis, 2005).

According to Gilland, (2002), Fertility rate and Overpopulation is related to the issue of birth control; some nations, like the People's Republic of China, use strict measures to reduce birth rates. Religious and ideological opposition to birth control has been cited as a factor contributing to overpopulation and poverty. Some leaders and environmentalists (such as Ted Turner) have suggested that there is an urgent need to strictly implement a China-like one-child policy globally by the United Nations, because this would help control and reduce population gradually and most successfully as is evidenced by the success and resultant economic-growth of China due to reduction of poverty in recent years.

Indira Gandhi, late Prime Minister of India, implemented a forced sterilization programme in the 1970s. Officially, men with two children or more had to submit to sterilization, but many unmarried young men, political opponents and ignorant men were also believed to have been sterilized. This program is still remembered and criticized in India, and is blamed for creating a wrong public aversion to family planning, which hampered Government programmes for decades.

Unplanned population increase in the world has resulted into a number of problems which include;

Inadequate fresh water-for drinking as well as sewage treatment and effluent discharge. Some countries, like Saudi Arabia, use energy-expensive desalination to solve the problem of water shortages hence depletion of natural resources, especially fossil fuels.

Increased levels of air pollution, water pollution, soil contamination and noise pollution. Once a country has industrialized and become wealthy, a combination of government regulation and

technological innovation causes pollution to decline substantially, even as the population continues to grow.

Deforestation and loss of ecosystems that sustain global atmospheric oxygen and carbon dioxide balance; about eight million hectares of forest are lost each year hence changes in atmospheric composition and consequent global warming

Irreversible loss of arable land and increases in deforestation and desertification can be reversed by adopting property rights, and this policy is successful even while the human population continues to grow.

Mass species extinctions. from reduced habitat in tropical forests due to slash-and-burn techniques that sometimes are practiced by shifting cultivators, especially in countries with rapidly expanding rural populations; present extinction rates may be as high as 140,000 species lost per year.

High infant and child mortality. High rates of infant mortality are caused by poverty. Rich countries with high population densities have low rates of infant mortality.

Intensive factory farming to support large populations which results into human threats including the evolution and spread of antibiotic resistant bacteria diseases, excessive air and water pollution, and new virus that infect humans.

Increased chances of emergence of new epidemics and pandemics. For many environmental and social reasons, including overcrowded living conditions, malnutrition and inadequate, inaccessible, or non-existent health care, the poor are more likely to be exposed to infectious diseases. Starvation, malnutrition or poor diet with ill health and diet-deficiency diseases (e.g. rickets). However, rich countries with high population densities do not have famine.

Poverty and inflation are aggravated by bad government and bad economic policies. Many countries with high population densities have eliminated absolute poverty and keep their inflation rates very low.

Unhygienic living conditions for many based upon water resource depletion, discharge of raw sewage and solid waste disposal. However, this problem can be reduced with the adoption of sewers. For example, after Karachi, Pakistan installed sewers, its infant mortality rate fell substantially.

Elevated crime rate due to drug cartels and increased theft by people stealing resources to survive

Conflict over scarce resources and crowding, leading to increased levels of warfare.

Less Personal Freedom / More Restrictive Laws. Laws regulate interactions between humans.

Law "serves as a primary social mediator of relations between people." The higher the population density, the more frequent such interactions become, and thus there develops a need for more laws to regulate these interactions.

Urban designer Arth has proposed a "choice-based, marketable birth license plan" he calls "birth credits." Birth credits would allow any woman to have as many children as she wants, as long as she buys a license for any children beyond an average allotment that would result in zero population growth (ZPG). If that allotment was determined to be one child, for example, then the first child would be free, and the market would determine what the license fee for each additional child would cost. Extra credits would expire after a certain time, so these credits could not be hoarded by speculators. Another advantage of the scheme is that the affluent would not buy them because they already limit their family size by choice, as evidenced by an average of 1.1 children per European woman. The actual cost of the credits would only be a fraction of the actual cost of having and raising a child, so the credits would serve more as a wake-up call to women who might otherwise produce children without seriously considering the long term consequences to themselves or society.

Historically, human population control has been implemented by limiting the population's birth rate, usually by government mandate, and has been undertaken as a response to factors including high or increasing levels of poverty, environmental concerns, religious reasons, and overpopulation. While population control can involve measures that improve people's lives by giving them greater control of their reproduction, some programs have exposed them to exploitation. Worldwide, the population control movement was active throughout the 1960s and 1970s, driving many reproductive health and family planning programs. In the 1980s, tension grew between population control advocates and feminist women's health activists who advanced women's reproductive rights as part of a human rights-based approach. Growing opposition to the narrow population control focus led to a significant change in population control policies in the early 1990s.

More often in our daily lives, we rely on dynamic information even for making timely online decisions. This ranges from real-time weather and traffic information to stock quotes to financial and news alerts. Indeed this is in total agreement with the quest for real-time information dissemination systems.

Therefore there is need for developing systems that use internet technology but which are fully customized so as to provide a comprehensive solution to the problem at hand.

2.1 Records Management System

According to Records Management Vendor, 2006, Records Management system is a computer program (or set of programs) used to track and store records, they commonly provide specialized security and auditing functionalities tailored to the need of users. In this case, the URGMIS will be used to take and store records such as birth and death certificates.

International Standard Organization (ISO), (2001) defines record management as “The field of management responsible for the efficient and systematic control of the creation, recipient, maintenance, use and disposition of records including the processes for capturing and maintaining audience of information about business activities and transaction in form of a record.”

Conolly, (2002) defines a record as digital information with value to an organization like database. Databases are now such an integral part of our day-to-day work that we are not aware we are using one.

Charles (2002) noted that, a records management system is an agency- wide system that considers the reasons, the processes, and the means necessary for a document to exist and be used in Record Management System (RMS) must cover the entire life span of the document, from its generation to its destruction. It provides for the effective storage, retrieval, manipulation, achieving and viewing of information, records, documents, or files that are related to a single subject. RMS allows one resource of data input and multiple reporting mechanisms and enables an agency to deal with its records in a simple environment. It should provide the ability to generate project statistics for management.

2.2 Types of Record Management

2.2.0 Manual Record Management

This involves a variety of diverse disciplines. At the simplest, it indexes and organizes paper documents. In the registrar department, this is usually a matter of filing the deaths and births documents and making them available for retrieval. Bell,(2001).

2.2.1 Problems Associated with Manual Records Management System.

- Records retrieval with manual system is time consuming.
- A lot of storage space is required for manual record.
- Poses security threats to individual records.
- Difficulty in records management.

2.2.2 Online Records Management System.

This is a computer program (or set of programs) used to track and store records .It ensures that all data generated by the registrar department is properly classified, categorized and stored in the repository and made available when needed by the users. The system also has to be selected with care taking into consideration the needs of the business, the type of data generated, how it will be stored, and how it will be published or displayed and in what format.

2.2.3 Web based information systems

An information system is a set of interrelated components working together to collect, process, store, and disseminate information to support decision- making, coordination, control, analysis

and visualization in an organization Laudon and Laudon, (2002). Within the context of information dissemination, this implies that an information system should among its components have source, interface, dissemination channel, database (storage) and recipient interface.

The World-Wide Web, along with other Internet based services, has emerged as the most appropriate universal platform for information dissemination, sharing, and computer-mediated communication.

Although the Web has evolved greatly since its inception, dissemination and delivery of rapidly changing information to large user communities remains a challenge. More often in our daily lives, we rely on dynamic information even for making timely online decisions. This ranges from real-time weather and traffic information to stock quotes to financial and news alerts. Indeed this is in total agreement with the quest for real-time information dissemination systems.

Therefore there is need for developing systems that use internet technology but which are fully customized so as to provide a comprehensive solution to the problem at hand.

2.3 Databases

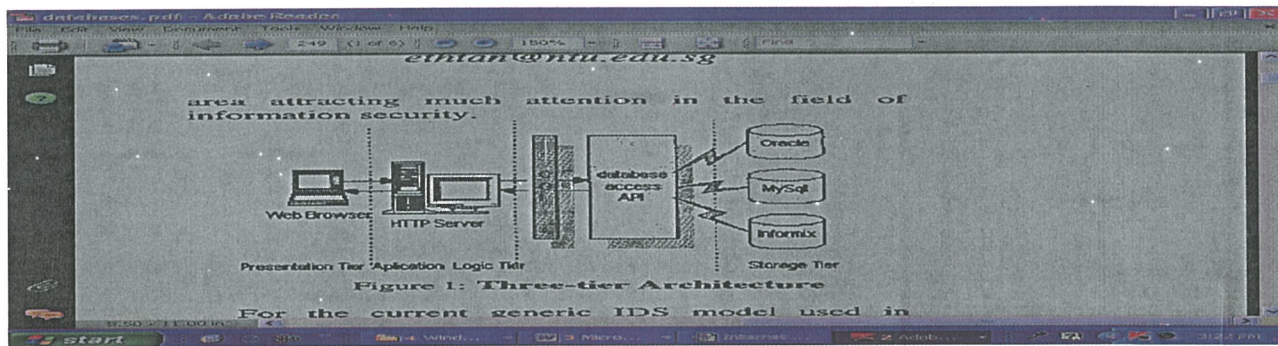
Databases are a shared collection of logically related data, and a description of this data is designed to meet the information needs, Connolly and Begg, (2004). Computer-based databases have reduced data storage requirements and improved the efficiency of data retrieval. As a result, raw data from many users and organizations can be reported very quickly and most importantly – amazingly accurately. They can be online (web-based) or offline. Online discussion forums contain web-based databases.

Databases have several components which include: a System catalog (Data dictionary or Metadata) – which provides a description of data to enable program–data independence. Database systems are managed using Database Management Systems (DBMS) which is a software system that enables users to define, create, maintain, and control access to the database. Databases are built on architectures, which address the system design issues that make the DBMS work. It is an invaluable reference for database researchers, practitioners and for those in other areas computing interested in the system design techniques for scalability and reliability. Key uses of databases include; helping in the storage, management and retrieval of vast amounts of information.

2.3.1 The Architecture of Web Based Databases

With the wide availability of information via the Internet, the modern network has developed from the traditional mode to a three-tier architecture consisting of presentation, application logic tier and data storage tier. As illustrated in figure below, the three-tier architecture (web-based database system) has a capability for dynamic information support.

Figure 1 - Three-Tier Architecture of a Web-based Database System.



Adapted from Shu and Tan, (2002).

2.4 The Case for Web Based Systems

The merits of using the web for information management as: First, information on the web is multimedia, which is richer than the traditional computer-based data presentation. Second, all data are stored and presented in standard format. This makes it much easier for independent of others and has a very strong autonomy. Any modification of existing information has virtually no effect on other information available on the information integration and has hoc retrieval. Third, the web was scalable. That is, new information was easily added to the web with little restriction. Fourth, the web adopts distributed data processing. Every site on the web. Finally, web documents allow non-linear organization to better fit human cognition. Instead of relying on sequential presentation, web uses hyperlinks to organize multimedia documents, which adds richness to the human-machine communication process. The nature of web offers an information environment in which every user is both information consumer and provider.

On the merits of using the web to disseminate and retrieve information Laudon and Laudon, (2002) contend that Web browser software is extremely easy to use, requiring much less training

than even user-friendly database query tools. The Web interface requires no changes to the internal database. Companies leverage their investments in older systems because it costs much less to add a Web interface in front of a legacy system than to redesign and rebuild the system to improve user access.

Accessing corporate databases through the Web is creating new efficiencies and opportunities. In some cases even changing the way business is being done as well as using Web technology to provide employees with integrated firm-wide views of information. The major enterprise system vendors have enhanced their software so that users can access enterprise data through a Web interface.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This section presents the area to be studied, methods and techniques that are to be used in data collection, analysis and processing.

3.1 Data Collection Techniques

3.1.1 Observation

The observation method involved a careful study of existing birth and death certificates processing system in the office of the registrar general. The existing Information System was observed in order to understand information flow and how this data was being utilized in the office.

This method helped the researchers to learn about the problems related to birth and death certificates production in the office of the registrar general as well as any pressing concerns with the existing Information System. This method was cheap, easy to use and readily available to the researchers.

3.1.2 Reading existing Documentations

This involved carrying out research and extensive reading of existing materials and documentation regarding prenatal, antenatal, and infant health care; the requirements, design and implementation of information systems and all the already mentioned technologies.

Resources such as libraries and the internet were exploited. This method was easy to use and provided lot of background information.

3.2 Data Processing and Analysis

All the data captured during data collection was closely studied, edited and compared removing any noted inconsistencies, so rendering it useful to the researcher. It involved looking for key events that drive the group's activity, patterns of behavior, testing data sources against each other, triangulation of data, and reporting findings in a convincing and honest way to produce information that was accurate, relevant and viable in system design and development. Qualitative and quantitative methods of data analysis were employed on the collected data to transform it into useful information.

We used Qualitative analysis which is a research technique that is used to gain insight into the underlying issues surrounding a research problem by gathering non-statistical feedback and opinions rooted in people's feelings, attitudes, motivations, values, perceptions it was used for gathering what was known as soft data.

3.3 System Design tools

Design tools such as Data Flow diagrams (DFDs) and Enhanced entity relationship diagrams (EERDs) were used in the development of the system database. Enhanced Entity Relationship Diagrams shows the clear breakdown of entities, the relationship between them and their attributes.

- DFDs helped us understand the flow of information for the organization.
- DFDs and EERDs were easy to use, interpret and they were used to address/model a wide range of problems.

3.4 Technologies

Most of the software that we used in system implementation was chosen basing on the fact that: it is readily available, cheap, and most importantly supported rapid development time.

- HTML (Hypertext Markup Language):** is the predominant markup language for Web pages. It provided us with means to describe the structure of text-based information in a document—by denoting certain text as links, headings, paragraphs, lists, and so on—and to supplement that text with interactive forms, embedded images, and other objects. HTML was written in the form of tags, surrounded by angle brackets. Html also served to help in the creation of a website that enabled 2 register a user.

- VII. The system allows access to only authorized users who are expected to have a username and password.
- VIII. The system is easy to learn and use by its end users.

4.2.3 System Specifications

In order for the system to perform as expected, these are its specifications for hardware and software

Table 5: Hardware Requirements

Hardware	Minimum System Requirements
Processor	AMD phenom II 650 duo core processor 2.60ghz
Memory	3 GB
Hard Drive space	279GB
Monitor display	1024 × 768 High color-16 bit Recommended

Table 6: Software Requirements

Software	Minimum System Requirements
Operating Systems	Windows 7 ultimate Windows Server 2003
Database	My SQL Server
Server	My SQL Server
Adobe cs4	
Php	

4.2.5 System Constraints

- i. The system will only be accessible by authorized users.
- ii. A user may only register once.
- iii. Different users are limited to particular views of information.
- iv. Internet connection is required.

4.2.6 Data input forms

The screenshot displays a web design application window titled "DESIGNER". The main canvas shows a "BIRTH REGISTRATION FORM" with a dark blue header. Below the header, there are several input fields arranged vertically on the left side of a light blue background. The fields are labeled: "Registration ID", "Place of birth", "Date of birth", "First name", "Last name", "Sex", "Father's name", "Occupation", and "Mother's name". Each label is followed by a white rectangular input box. To the right of the main canvas is a "PROPERTY" panel with various settings for the selected element, including "Table", "Rows", "Cols", "Width", "Height", "CellPad", "CellSpace", "Border", "Align", and "Class". At the bottom of the window is a taskbar with several icons, including a globe, a folder, and a web browser. The system clock in the bottom right corner shows "9:49 AM 6/30/2011".

Figure 4.1 birth registration form

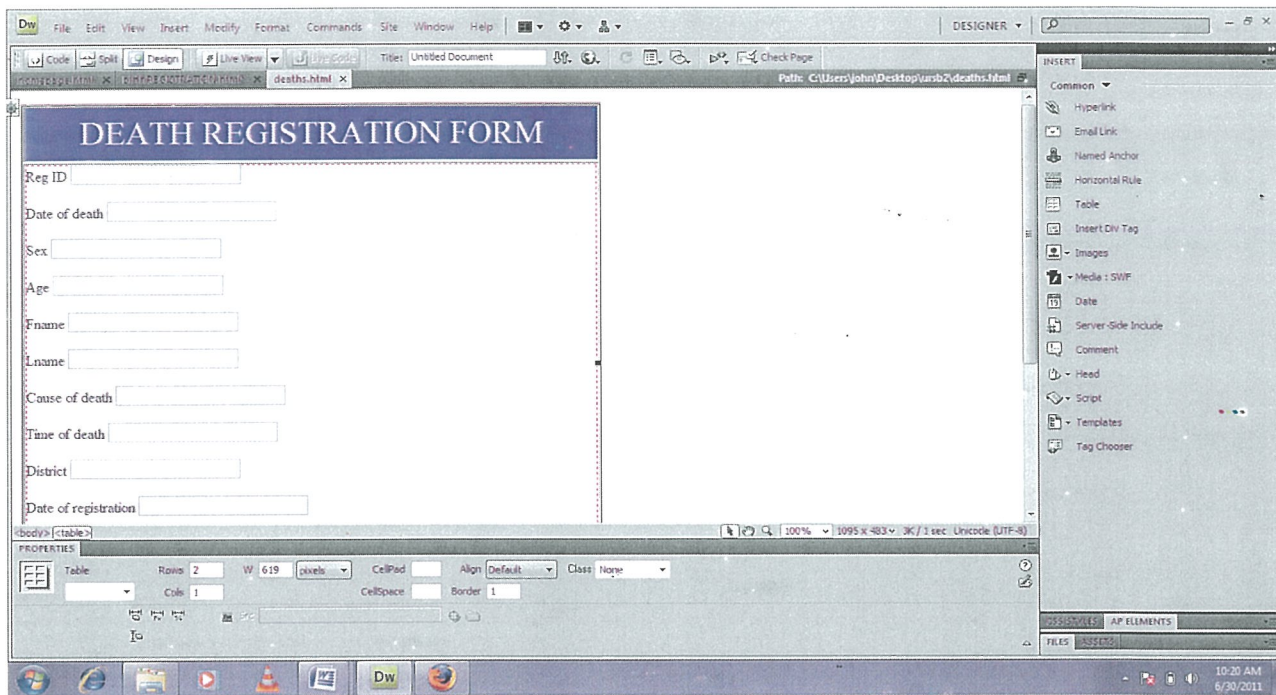


figure 4.2 Death registration form

4.2.7 Data output form

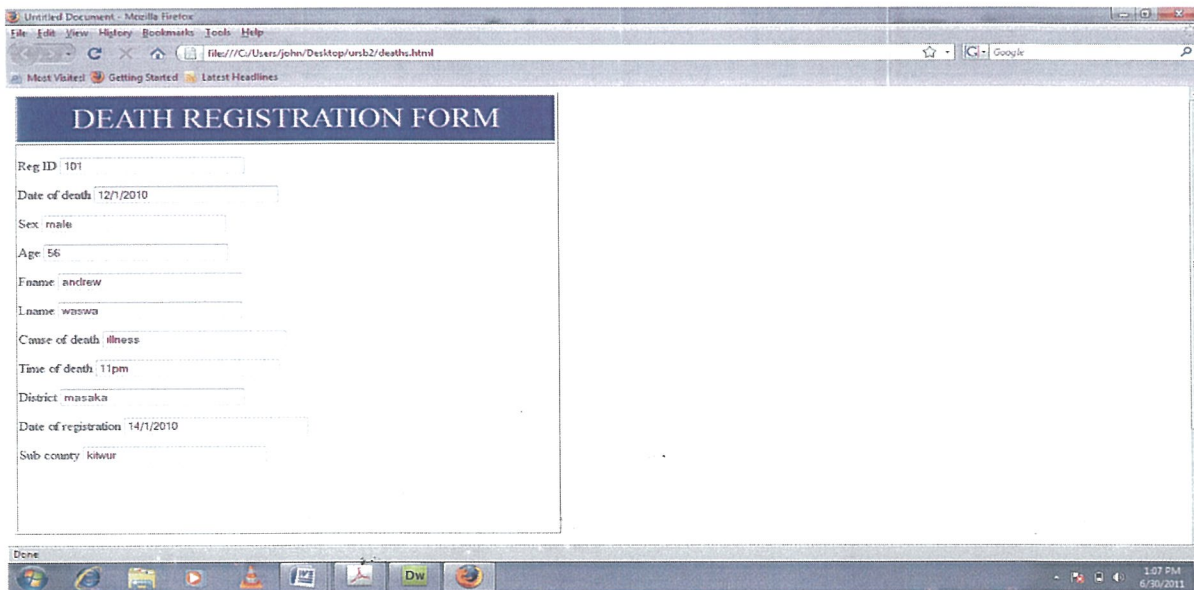


Figure 4.3 Death registration output form

4.3 System Design

System design is concerned with how the system functionalities are provided by different components of the system. System design tools such as: DFDs, EERDs were used in the development of the system and its database respectively.

4.3.1 Data Flow Diagrams

These are tools for structured analysis that examine inputs, outputs, and processes. They show how data moves and changes through a specified system in a graphical top-down fashion that is a graphical representation of a system's components, processes and the interfaces between them. They represent a logical model that shows what a system does, not how it does it; stressing the flow of data within a system

4.3.2. Enhanced Entity Relationship Modeling Concepts

Concepts employed are:

- Specialization
- Generalization

This is the modeling of superclasses and subclasses that adds more information to the data model, as well as bringing more complexity to database system development.

Specialization is the process of maximizing the differences between members of an entity by identifying their distinguishing characteristics

Generalization is the process of minimizing the differences between entities by identifying their common characteristics.

The models **V** (Figure 4.7) that are illustrated below have a constraint {Mandatory, Or} implying that from the superclasses: **Supplier**, there exist only the stated subclasses and the corresponding instances of these given subclasses can only belong to one particular subclass.

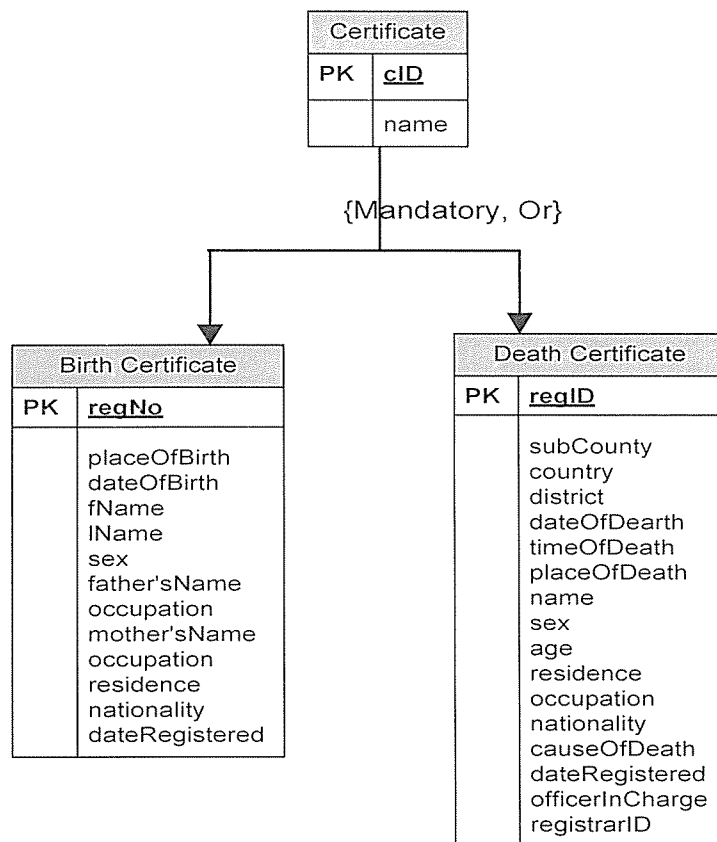


Figure 4.4: A relationship between Superclass (Certificate) and Subclasses (Death certificate and Birth certificate)

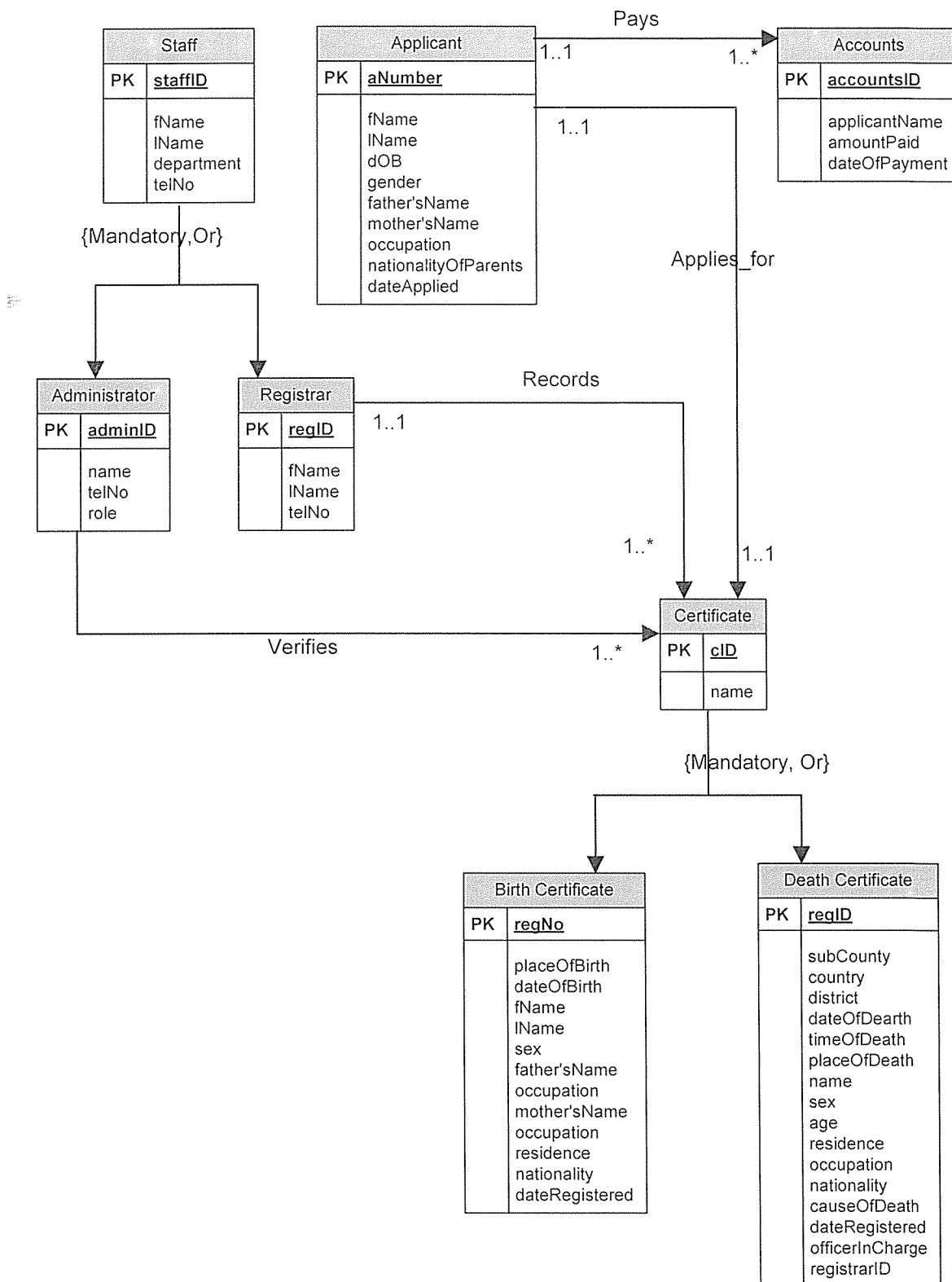


Figure 4.5: An Enhanced Entity Relationship Diagram of the System

4.3.2.1 Logical design

DATABASE ADMINISTRATOR (adminID{**PK**}, fName, lName, department, telNo, role, staffed{**AK**});

REGISTRAR (regID{**PK**}, fName, lName, department, telNo, staffID{**AK**});

APPLICANT (aNumber{**PK**}, fName, lName, Dob, sex, father'sName, mother'sName, occupation, nationalityOfParents, dateApplied);

ACCOUNTS (accounted {**PK**}, aNumber {**FK**}, applicantName, amountPaid, dateOfPayment);

CERTIFICATE (cID{**PK**}, name, aNumber{**FK**}, adminID{**FK**}, regID {**FK**});

BIRTH CERTIFICATE (cID {**AK**}, name, regNo {**PK**}, dateOfBirth, placeOfBirth, fName, lName, sex, father'sName, occupation, mother'sName, occupation, residence, nationality, dateRegistered);

DEATH CERTIFICATE (Cid{**AK**}, name, reg No{**PK**}, sub County, country, district, death Of Death, time Of Death, place Of Death, name, sex, age, residence, occupation, nationality, cause Of Death, date Registered, officer Incharge, registrar ID{**FK**})

CHAPTER FIVE

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

This chapter contains the Discussion, recommendation and conclusion on how each of our objectives was met and a summary of our results/findings of the system.

5.0 Discussions

This section is a means of ascertaining whether the system is in fulfillment of the set objectives.

The investigation of factors that have bearing on in the delay of birth certificates production and processing, find out weaknesses and problems in their processing in Uganda was achieved through the use of data collection methods such as interviews, questionnaires and observation. The main ones include beauracracy, corruption, poor records management and failure to embrace IT to help in automating their business processes to mention a few.

More importantly, it was during the data collection process that user requirements for the system were established

In order to design an automated online births and deaths records management System, Data flow Diagrams and Entity Relationship Modeling was done. With the use of data flow diagrams to examine data inputs, outputs, and processes while showing how data moves through the system. Entity Relationship Diagrams to find the entities their attributes and the relationship between those entities it is from these relations or tables that the system database were formed.

In terms of implementation of the above mentioned system, many technologies were employed to bring the system requirements and design to life. These included PHP, to create the application, MY SQL 2005 to create the database and HTML to create the website.

Testing and validation of the system involved: performing tests such as: unit testing and system testing were carried out using tools existent in Visual Studio 2008 Service Pack one to serve the purpose of making sure the system was functional. System validation was achieved through acceptance testing which ensured that the potential end users found the system easy to use and in fulfillment of their specified requirements.

5.1 Results/Findings

The Automated Online Births and Deaths Records Management System is an Information System that serves to capture, store, retrieve and disseminate information about both births and deaths, process certificates and records management in the office of the administrator general of Uganda. It offers a means of information sharing as well as automating the existing manually driven record keeping facility.

Clients' or certificate's applicants information is collected by a set of forms online via the internet. This so promotes automated and secure record keeping procedures for both births and deaths information, and to provide a data source meant to aid in the processing and management of birth and death certificates in the administrator general's office.

The information that is of great importance in this system is the contact information: telephone numbers and names, sub County, country, district, death Of Death, time Of Death, place Of Death, name, sex, age, residence, occupation, nationality, cause Of Death, date Registered, officer In charge, registrar for death certificates applicants. For birth certificate applicants information include; names, date Of Birth, place Of Birth, first Name, last Name, sex, father's Name, occupation, mother's Name, occupation, residence, nationality, date Registered;

The system has a website that provides information to the general public regarding births and deaths in Uganda. This website also contains application forms which enables clients to apply for certificates online and allows for information sharing among members of staff in the registrar generals department.

This front end interface, a user has to enter his/her user name and password to Login. This is important since it ensures that the system performs user validation on inputs. Incorrect entries trigger an error message.

5.2 Recommendations

There are further developments and functionalities that can be made to this system; these are:

To integrate the system to handle different means of payments by applicants. With the rapid advancement in technology alongside tense competition, further research and study should focus on online operation. This will enable many organizations to reap the benefits of the online operation such as online registration and easy access to the births/ deaths certificates.

We recommend that security of personal data should be highly put into consideration when developing online service delivery resources.

We also recommend for development of more online service delivery resources/systems and also improvement on the functionality of this particular system.

Finally the Ugandan government should consider the implementation of a national IT system to go beyond handling information but all public services Areas for Further Research

5.3 Areas for further research

Future works may be pursued in line with:

- A billing functionality may be added to handle clients due payments or applicants debt management
- Development of an online service delivery resources/systems and also improvement on the functionality of this particular system.

5.4 Conclusion

The challenges in the processing of birth and death certificates and their records managements in the registrar generals' department in Uganda can be reduced using an Automated Online Births and Deaths Records Management System. This is through automating their business processes to be done online over the internet.

Most consulted members of staff in the registrar generals' office were in agreement that the an Automated Online Births and Deaths Records Management System if properly implemented will indeed improve the processing, production of birth and death certificates and their records management even if it is at a small percentage.

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5.5 APPENDIX A: DATA ANALYSIS AND TIME SCHEDULE

JUNE	JULY
16 th to 19 th Submission of proposal	27 th to 30 th Project data collection
20 th to 22 nd Purchasing of hardware and software	1 st to 7 th Project development and summarizing project details
23 rd to 26 th Setting up hardware and installation of software	8 th to 15 th Writing, summarizing and conclusion of report

APPENDIX B. HARDWARE AND SOFTWARE REQUIREMENTS

1. One laptop computer
2. Digital Camera 6 mega pixel
3. Html(Hyper text markup language)
4. Cascading style sheets (css)
5. Wamp server 2
6. Mysql
7. Adobe dreamweaver cs4
8. Php scripting language

APPENDIX C . BUDGET

ITEM	SPECIFICATION	DESCRIPTION	AMOUNT	BENEFIT
One Laptop Computer	15 inch AMD Phenom(tm)II P650 Dual-core processor G62 hp	CPU Speed 2.60Ghz RAM 3GB Hard disk 296 GB	930,000/=	-portable -fast memory -large storage space for programs
Transport to and from residence to location of case study	By taxi		2,500/= per day	Location of study provides facts.
Digital camera	1 gb of speed		500,000/=	Entry of case study photos

APPENDIX D. CODES

CODE FOR REGISTRATION FORM IN PHP

```
<?php /*  
/*  
* To change this template, choose Tools | Templates  
* and open the template in the editor.  
  
//set up mysql*/  
  
//clean the variables  
  
$regID= $_POST['regID'];  
$fname = $_POST['fname'];  
$lname = $_POST['lname'];  
$pob = $_POST['pob'];  
$dob = $_POST['dob'];  
  
$fathername = $_POST['fathersname'];  
$foccupation = $_POST['foccupation'];  
$sex = $_POST['sex'];  
  
$mothername = $_POST['mothersname'];  
$moccupation = $_POST['moccupation'];  
$nationality = $_POST['nationality'];  
$subcounty = $_POST['subcounty'];  
$datereg = $_POST['datereg'];  
  
//insert the user into the database  
  
$query = "INSERT INTO birthcertificate  
(regID ,  
Fname lname ,
```

```

pob,
dob,
fathername,
foccupation,
sex,
mothername,
moccupation,
nationality,
subcounty,
datereg)

VALUES (
'$regID', '$fname', '$lname', '$pob', '$dob', '$fathername' , '$foccupation', '$sex',
'$mothername', '$moccupation', '$nationality', '$subcounty', '$datereg');"

```

```

$c = mysql_connect("localhost", "root", "");
mysql_select_db("online_registration", $c);

if(mysql_query( $query ))
{
echo "Success";
}
else
{
echo "failed";
}

?>

```

CODE FOR LOGIN FORM IN PHP

```
<?php

/*
 * To change this template, choose Tools | Templates
 * and open the template in the editor.
 */

//set up mysql
mysql_connect("localhost", "root", "");
mysql_select_db("online_registration");
session_start();

function clean($string)
{
    //function used for cleaning mysql injection garbage from strings
    if (get_magic_quotes_gpc()) {
        $string = stripslashes($string);
    }
    return $string;
}

function go_birth_reg($error=0)
{
    //redirect to the form with an error
    $string = "
    <script type=\"text/javascript\">
    <!--
```

```
window.location = \"../homepage.html\";
```

```
if($error == 1)
{
$string .= \"?error=1\";
}
```

```
$string .= \"\
```

```
-->
```

```
</script>
```

```
There has been an error logging in, please click <a
href=\"../index.php?error=1\">here</a> to go back home.
```

```
\";
```

```
echo $string;
```

```
die();
```

```
}
```

```
function go_home($error=0)
```

```
{
```

```
//redirect to the form with an error
```

```
$string = \"
```

```
<script type=\"text/javascript\">
```

```
<!--
```

```
window.location = \"../homepage.html\";
```

```
if($error == 1)
```

```
{
```

```
$string .= "?error=1";  
}
```

```
$string .= "\"  
-->  
</script>
```

There has been an error logging in, please click here to go back home.

```
";  
echo $string;  
die();  
}  
if( $_POST['username'] == " " || $_POST['password'] == " ")  
{  
    //ensure that all parts of the form have been filled out.  
    go_home(1);  
}
```

//create a password hash

```
$username = clean($_POST['username']);  
$password = ($_POST['password']);  
$result = mysql_query("SELECT * FROM users WHERE username='{ $username}' &&  
password='{ $password}'");  
if(mysql_num_rows($result) < 1)  
{  
    //email or password incorrect  
    go_home(1);  
}
```