# I.DECLARATION

I, Mbabazi Noela a student of University of Kigali hereby declare that the proposer report entitled **Employee management system** is my original work and has previously never been submitted to any other University or Institution.

Student Name: Mbabazi noela

Sign \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_

Declaration by the supervisor(s)

This research has been submitted with our approval as The University of Kigali Supervisor(s).

Name: Mr. Ishimwe Olivier Kevin

Sign \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_

For and on behalf of University of Kigali

Head of Department

Name: Mrs. NYAKUNDI MERCY

Sign \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_

For and on behalf of University of Kigali

# II.DEDICATION

This project proposal is dedicated with profound admiration and appreciation to God for giving me strength and breathe and my teachers for their moral support. Great appreciation also goes to my supervisor Mr. Ishimwe Olivier Angel Kevin and all my lecturers, classmates and family who made it a success through their constant support supervision, encouragement and moral support.

# III.ACKNOWLEDGEMENTS

I would like to acknowledge and give thanks in a special way to the Almighty God from whom all knowledge, wisdom and understanding rightly comes, for all he has done while carrying out my studies and project.

My special thanks are also addressed to my parents, sisters and brothers, relatives and friends for their financial and moral support.

It is a great pleasure for me to also acknowledge the assistance and support of people who helped me to start and finish this project proposal successfully especially Mr. Ishimwe Olivier Ange Kevin who guide me in accomplishment of this work. I would like to give my special thanks to UoK for giving me enough knowledge and skills that helped me to conduct this work.

I would like also to thank all lecturers, especially those of Business Information Technology department for the favorable learning environment and cooperation during my studies at University of Kigali.

**May All God Bless You**

# ABSTRACT

The main aim of this research proposal is to design and implement **“ONLINE SECTOR MANAGEMENT INFORMATION SYSTEM**” for BYUMBA SECTOR; this is an interactive web application based system to BYUMBA SECTOR in which it is used as the management tool for Byumba sector services .

It has been developed based on the information obtained from BYUMBA SECTOR by means of interview, observation as the instrument of data collection.

The project was focused on BYUMBA SECTOR because of problem of lacking the digital way which can help them to automate and store their daily activities and records of CITIZENS. PHP, Jascript, Bootstrap, CSS Apache and HTML were used as programming language and software such as Adobe macromedia and xampp were used to design this application.

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**CHAPTER ONE**

## 1.0 INTRODUCTION

Computer based systems and information technology have had a significant impact on organizations over the past thirty years. They are viewed as means of providing competitive edge and hence, they are becoming part of the organization strategy. Recent generations of information systems in public sector support electronic delivery of public services to the citizens and business enterprises by enabling them to make most of their transactions with the government through electronic channels such as the Internet. (AJBUMA, 2010)

This study focuses on Design and Implementation of Administrative Sector Management Information System for byumba Sector in Gicumbi District, in northern province, Rwanda. The aim of the study is to deliver public services to the citizen via internet as an electronic channel. Information system is an integrated set of components for collecting, storing, and processing data and for providing information, knowledge, and digital products. Therefore, such system will provide capability for citizen to register their information and booking appointments.

This study will be conducted in byumba Sector-Gicumbi District, in Kigali province, Rwanda. byumba sector has 829 km² of the surface Area and 572,000 populations per km².

## 1.1 Background of the study

During the 1950s and 1960s, MIS were first developed but came into the organizational mainstream somewhat later. However, the explosion of other organizational applications of IT has led MIS. Nonetheless, the fundamental importance of MIS has meant some writers continue to provide a broad and deep discussion of the topic. MIS provide reports which assist the managerial monitoring and control of organizational functions, resources or other responsibilities. Public sector MIS, address internal government transactions, public administration/regulation, and public service delivery.

However, many public sectors have developed management information systems to monitor and control the services that they provide. Both the US and UK Social Security agencies have developed MIS to report on the welfare payments and services that they provide. (Heeks, 1998).

In Africa, different countries like Kenya, are moving towards becoming more efficient operationally by collaborating across traditional departments and has to become more responsive towards its citizens’ needs. The government faces an increased pressure to form an effective public sector management system in order to bring public services online.

In 2012, the Kenyan government started a program of investing in ICT infrastructure with the help of foreign funding. Despite Kenya being classified as a less-developed country according to the UN’s Computer Industry Development index, the country managed to successfully introduce public sector services online with the aim of improving public services and reducing corruption. (Nunow, 2014).

In Rwanda, in 1998, the Rwandan ICT for Development (ICT4D) policy, commonly known as the National Information and Communication Infrastructure Plan (NICI) process began. The process was designed to implement the necessary policies and plans capable of addressing Rwanda’s developmental challenges in the information and technology age. (Muhaise, 2015). The use of Computerized Information Systems (CIS) was introduced in the year 1999.

In Rwanda, much of the domestic initiative for the ICT service industry has come from the government and has mostly targeted the institutionalization of service delivery in order to consolidate government services, reduce duplication of functions, increase efficiency, and cut down on costs. (Canisius, 2005)

Therefore, there is a need of using computerized information systems in administration of byumba sector in order to achieve different objectives and good service delivery.

Many sectors in Rwanda like byumba sector have not yet embraced adoption of automated information systems. Service delivery processes are done manually at byumba sector which creates room for error. For instance being late to register for a certain document like birth certificate. Thus, this project intends to come up with a computerized information system that will allow citizen to book an appointment with leaders and registering themselves for different documents like birth certificates. This will help byumba sector to achieve its objectives and good service delivery.

## 1.2 Statement of the problem

Despite the importance of booking appointment and registration of documents in the achievement of objectives at byumba sector, appointments and registration are not adequately managed by the sector administration. Appointments and registration for different documents practices have a number of problems which include insufficient technology and low priority of introducing ICT in the scheme of booking appointment and registration. Thus, management of sector information and booking appointments becomes an issue of great concern to sector stakeholders such as leaders, citizen, and government. Below are some problems to the current system:

1. Crowd of people: Since every registration like birth, death, and marriage are done to the sector, there is crowd of people waiting for services.
2. Time wastage: Service delivery in byumba sector has not been effective for a long time. Citizens have to wait for a long time at various departments counter which leads to a lot of time wastage and sometimes leaders are conducting meetings and don’t have time for them.
3. Lateness: Since everything and every detail are done down in the offices of the sector, there is a late problem. Many people who are 16 and above years old, be late for registering themselves to get Identification card because they do have to go down to the offices.
4. Bad service: byumba sector is marred with dismal performance in all the facets of service quality including reliability, responsiveness, tangibles assurance and empathy. There is lack of transparency, efficiency and unsecured delivery of service.

In the light of the above scenario, this study intends to design and implement a computerized information system which is the better solution for byumba Sector registration management and booking appointments in order to achieve its objectives and public service delivery.

## 1.3 Objectives of project

### 1.3.1 General Objectives

The main objective of this study is to design and implement a computerized Administrative Sector Management Information system that will facilitate byumba Sector to retrieve information of citizen and meet with them according to the booked time in order to achieve its objectives and service delivery.

### 1.3.2 Specific Objectives

1. To provide graphical user friendly graphical interface
2. To provide the way the citizen will register
3. To enable citizens to request document to the leader
4. To enable citizens to book appointment with leader
5. Allow leader to accept/deny citizens appointments
6. Allow leader to provide requested document to the citizen

## 1.4 Research Questions

1. How will the system provide graphical user friendly graphical interface?
2. How will the system will provide the way the citizen will register?
3. How will the system will enable citizens to request document to the leader?
4. How will the system will enable citizens to book appointment with leader?
5. How will the system will Allow leader to accept/deny citizens appointments?
6. How will the system Allow leader to provide requested document to the citizen?

## 1.5 Scope of the project

This system is limited to private companies’ markets publishing and its processes, system notification to supplier, suppliers apply for the market and once he is selected, he is now allowed to sign the contract, then supply goods or services and finally the payment is done. The System must be available anytime and anywhere.

### 1.5.1 Geographical scope

The study will be conducted in byumba Sector in gicumbi District, in Kigali province, Rwanda.

### 1.5.2 Content scope

The study will investigate the existing information system in byumba Sector. I will examine the system to find out any strengths and weaknesses related to the current sector information management system, the available opportunities to solve the problems and set or revise the objectives accordingly. Then, the study will analyze the needs of the upcoming Administrative Sector Management information system.

### 1.5.3 Time scope

The study will cover a period of two months (july to sept 2019) as shown in Appendices.

## 1.6 SIGNIFICANCE OF THE PROJECT / INTEREST OF THE PROJECT

### 1.6.1 Personal interest

This work is helpful for me to pass an academic background The knowledge from ,will be helpful for me for further studies and competency on labor market.

### 1.6.2 Institution interest

This ending university studies work is for students who are completing their university study where each student should be able to carry out his/her our research concerning the enterprises at his/her choice and organize the files of that enterprise.

Within this work the research has considered two academic interests:

* **Primary,** the ministry of education will be ensured that the student who is going to get the certificate is capable of producing a work on his field of student (i.e. Able to do something in ICT).
* **Secondary**, the findings of this project will be and useful for future researchers and other people who are interested in the same field of study.
* **University,** this knowledge will be helpful to the students for further studies and competency on labor market. The findings of this project will be and useful for future researchers and other people who are interested in the same field of study

### 1.6.3 Public interest

It will help other researchers for new information to make their own system, every it will get the job with no complexity and they will find how to use their theory studies information practice by working with the system implemented

## 1.7 limitation of the project

This project will not provide the graphical chat between citizens and leaders, the communication method are done outside the system by using telephone or email.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

The purpose of this chapter is to provide the theory of definitions of the key concepts that were used in this dissertation, the comparison of this work with many others, and the contribution to solve the problems found in the read dissertation.

## 2.1 Introduction

This process usually includes a study of the current system and its problems and envisioning ways to design a new system. Analysis of current system helps in giving a detailed views and understanding of how the present system works. The analysis will give an indication of the problems faced in the current system and give clear direction of how to solve the problems by either improving or replacing the current system.

### 2.1.1 DEFINITION OF KEY TERMS

1. information:  is data that has been processed in such a way as to be meaningful to the person who receives it(ecocomputenotes 2019)

1. **System:** A system is a collection of elements or components that are organized for a common purpose. The word sometimes describes the organization or plan itself (and is similar in meaning to method, as in “I have my own little system”) and sometimes describes the parts in the system (as in “computer system”). (IS Dictionary 2010).
2. **.Information System Management Practices**

Information systems management (ISM) is a multifaceted field, and requires multidisciplinary perspectives. ISM is seen as one solution to improve effectiveness in public service delivery. Investments in IS have grown rapidly in the last decade and there are great expectations that IS will solve many problems, especially with regard to the diminishing resources.  Information systems management is aim to achieve some improvement or change in qualitative aspects of the world faster processing, fewer delays, information that is more accurate and up to-date, lower costs, and so forth. (ABDI, 2014)

1. **Leader**: the person who leads or commands a group, organization, or country(oxford,2012)
2. **Admin:** admin in this system is anyone who is legally in the system and has duties to manage the entire system like troubleshooting of a system, backup and recovery. (Collins dictionary, 2019).

### **citizen:**  Person who is entitled to enjoy all the legal rights and privileges granted by a state to the people comprising its constituency, and is obligated to obey its laws and to fulfill his or duties as called upon. Also called national. (Harrisomen M, 1998).

## 2.2 Review of Past Studies

## 2.2.1 Information System Management Practices

Information systems management (ISM) is a multifaceted field, and requires multidisciplinary perspectives. ISM is seen as one solution to improve effectiveness in public service delivery. Investments in IS have grown rapidly in the last decade and there are great expectations that IS will solve many problems, especially with regard to the diminishing resources.  Information systems management is aim to achieve some improvement or change in qualitative aspects of the world faster processing, fewer delays, information that is more accurate and up to-date, lower costs, and so forth. (ABDI, 2014)

## 2.2.2 Administrative Sector Management Information System

The Republic of Rwanda is divided into Provinces, Districts, Sectors and Cells. The District is the basic political-administrative unit of the country. Sectors are the third level administrative subdivision in Rwanda and there are 416 Sectors. However, this study will focus on byumba Sector only. In this sector there are different activities that normally takes place regarding to the public services delivery. Some of them are registration of Mutuelle (Community Based Health Insurance), Birth Certificate, Application for National Identification Card, Marriage Certificate, Certificate of Celibacy, and land registration.

Information systems management is aim to achieve some improvement or change in qualitative aspects of the world faster processing, fewer delays, information that is more accurate and up to-date, lower costs, and so forth.  Management Information System is seen as one solution to improve effectiveness in public service delivery. Public sector MIS address internal government transactions, public administration/regulation, and public service delivery.

This study attempts to address the challenges faced by byumba sector and other sectors in Rwanda in the use of information system that serves as a major information tool that sustains and improve the public services delivery in order to achieve administrative goals and service delivery.

## 2.3.3. Review of existing similar systems

**Irembo**

Irembo is a Government to Citizen e-Service portal, which facilitates the citizen to submit the application and make the payment for various services. This is a joint project by Government of Rwanda and Rwanda Development Board. It is an initiative by Rwanda Development Board in conjunction with Ministry of Local Government, Rwanda National Police, National Public Prosecution Agency and the National Identification Agency. It is a web based application for every citizen and business (es) in Rwanda to access all government e-services. (Services, n.d.)

Irembo is the one-stop portal for e-Government services. Electronic Government (e-Government) refers to the application of information and communications technology (ICT) to innovate and modernize the field of public administration. It allows greater public access to information, and make government more accountable to citizens.

One-stop portal for government refers to the integration of public services from a customer of public services' point of view. It allows citizens, businesses and other authorities to have 24 hours access to public services from their home, their offices or even on the move using different access media and devices. The concept requires that all public authorities are interconnected and that the citizen is able to access public services by a single point even if these services are actually provided by different departments or authorities. One-stop government requires the reengineering of the public sector's processes towards online public services. It calls for a holistic framework that supports integrated modelling of electronic public services and synchronization with the technical developments. (Tambouris, 2002)

Irembo as one-stop portal, grant access to information and services, and act as the gateway to all Rwandan Government services and provides this service with ease, efficiency and reliability. Services are accessible through multiple delivery means (or channels), including physical presence at designated offices, call centers, Internet, and mobile devices.

**ECitizen Kenya**

ECitizen is an official digital platform which enables Kenyan citizens, residents and visitors to access government services online. The services offered include business name search and registration, notice of marriage, registration of marriage, driving licenses, land searches and clearances, passport and visa applications. The system allows citizens to sign up, apply for government services and conveniently pay using mobile money, credit/debit cards and online banking from local banks. Users receive email and SMS notification every time their application has progressed. One can get services in and around business, marriages, driving, lands immigration and civil registration services offered by their respective government departments. (Tsuma, 2015)

For instance, through the Office of The Attorney General and Department of Justice one can get services involving getting married or entering a civil partnerships in Kenya. Business name search and registration services are also offered. This is possible through, business, a portal of eCitizen which enables individuals owning business to access Government to Business service online. The services include application of business licenses, permits and business registration. (Tsuma, 2015)

To add on that one can apply for a provisional driving license, book in driving test, get a driving license, pay fees and track the application through the NTSA (National Transport and Safety Authority) in eCitizen. (Tsuma, 2015)

Thirdly, The Department of Immigration Services offers services such as application of passports and application of a work permit. In eVisa, another portal of eCitizen one can apply for a visa.

Lastly, The Ministry of Land Housing and Urban Development offers services such as searching for a title deed, land rent clearance demand notice and payments all through eCitizen. (Tsuma, 2015)

ECitizen is a platform designed to cater majorly for the citizen. It improves the speed in which the government serves its citizens thus making service rendering convenient.

**ECitizen Portal Uganda**

The eCitizen portal is a one-stop online center for Government online services. Its main objective is to enhance Government service delivery to citizens, non-citizens, businesses and to Government Ministries, Departments and Agencies (MDAs). The benefits include making Government services more accessible, reducing access cost and queuing at Government offices, transparency, timeliness and increasing convenience of transaction with the Government of Uganda anytime and from anywhere. (Okwii, 2015)

The portal has been designed to aggregate all Government services which are offered online and present them on a single portal. The portal allows one to access services such as eTax, Business registration, trading license registration and social security statements among others.

The portal is intended to reduce time and costs to citizens in accessing Government services and to increase efficiency in the provision of public service to citizens. (Okwii, 2015)

## 2.3 Existing system

**Irembo**

Irembo is a Government to Citizen e-Service portal, which facilitates the citizen to submit the application and make the payment for various services. However, this portal has some weaknesses.

Not user friendly: Julius Karenzi – a Kigali-based banker seeks Irembo services on a regular basis. However, he has to seek agents to conduct the process for him. “The system is not easily accessible. Sometimes I give up in the middle of the process.” (Ngabonziza, 2019)

Overcharging customers: At different Irembo service providing points, customers claim to be overcharged. (Ngabonziza, 2019)

Absence of booking appointment service: Irembo provide different public services to the citizen but it doesn’t allow them to book an appointment with different leaders.

**ECitizen**

The e-Citizen is a portal for citizens to access information and services provided by the Kenyan government. However, this portal has some weaknesses.

Overcharging customers: Kenyans using the government online payment portal eCitizen are spending more for services than when they paid in cash limiting the expected benefits of the digital switch. (Njoroge, 2016)

Absence of booking appointment service: eCitizen provide different public services to the citizen but it doesn’t allow them to book an appointment with different leaders.

**ECitizen Portal Uganda**

The eCitizen portal is a one-stop online center for Government online services. Government services more accessible, reducing access cost and queuing at Government offices, transparency, timeliness and increasing convenience of transaction with the Government of Uganda anytime and from anywhere. However, this system has some weaknesses.

Absence of booking appointment service: eCitizen provide different public services to the citizen but it doesn’t allow them to book an appointment with different leaders.

## Research gaps

It is obvious that all the above studies left a knowledge gap in their researches. None of the system which implement booking appointment service to the public. Therefore, this study intends to assess an existing information system for byumba sector. Furthermore; the study will design and implement a system that will facilitate byumba sector to deliver public services online and allow citizens to book for appointments. This will allow byumba sector to achieve its objectives and service delivery.

## 2.4 Proposed system

**Administrative Sector Management Information System**

Computer based systems and information technology have had a significant impact on organizations over the past thirty years. They are viewed as means of providing competitive edge and hence, they are becoming part of the organization strategy.  Recent generations of information systems in public sector support electronic delivery of public services to the citizens and business enterprises by enabling them to make most of their transactions with the government through electronic channels such as the Internet. (AJBUMA, 2010)

This study focuses on Design and Implementation of Administrative Sector Management Information System for byumba Sector in gicumbi District, in northern province, Rwanda. The aim of the study is to deliver public services to the citizen via internet as an electronic channel and allow them to book for appointments. Information system is an integrated set of components for collecting, storing, and processing data and for providing information, knowledge, and digital products. Therefore, such system will provide capability for citizen to register their information and booking appointments with different leaders.

This study will be conducted in byumba Sector-gicumbi District, in northern province, Rwanda. byumba sector has 829 km² of the surface Area and 572,000 populations per km².

The proposed system will help citizen of byumba sector to register themselves for different documents like birth, death, marriage certificates and to book an appointment with different leaders in different charges. The common functions of the computerized Administrative Sector Management information system will be to support the registration of different documents anytime and handling the issue of crowd of people and bad services in the sector by booking the appointments. The registration of documents will be done adequately with minimum of time and money by the use of the computerized information system.

This system will improve the modern way of receiving citizens information, reducing crowd of people and bad services by booking appointments which will lead to a fruitful and modern sector systems in countrywide.

### 2.4.1 Theoretical / Conceptual Framework

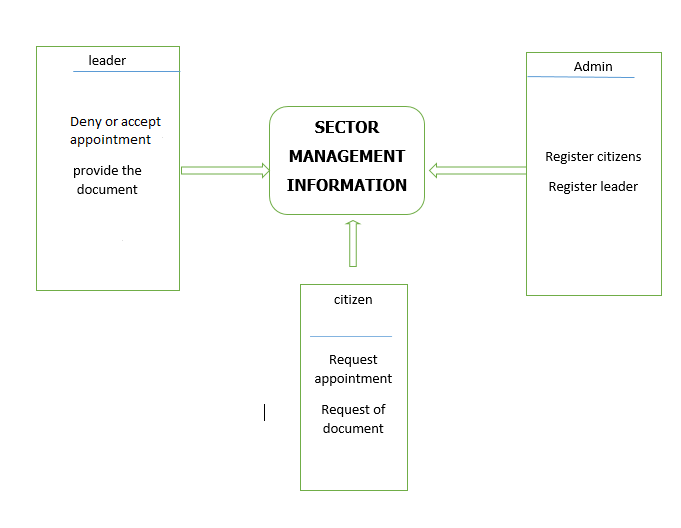


Figure 1: context diagram

### 2.4.2 Critical Review

The main aim of this research proposal is to design and implement **“online market publication and evaluation system**” for BSC; this is an interactive web based system to BSC in which it is used as the management tool for markets publication.

It has been developed based on the information obtained from Rwandan companies by means of interview, observation as the instrument of data collection.

The project was focused on BSC because of problem of lacking the digital way which can help them to automate their daily activities and it is difficult to reach to a great number of suppliers. And this cause many problems such as time consuming and expensive services. The people who need to publish market had to come to company helps them to publish their products through social medias, radios and make frames to put on road. It is difficult for the people who are far of Kigali because they can’t reach easily to where the company is located.

PHP, Apache and HTML were used as programming language and software such as Adobe macromedia and Xampp were used to design this application.

The contribution of this project is of high value to Rwanda market where they find someone to publish their markets.

## 2.4.3 SUMMARY

In summary, this chapter has summarized the information from authors and researchers who have carried out research in the same field of this study. However, all those research have left a knowledge gap in their researches. None of the system which has implemented booking appointment service to the public. Therefore, this study intends to assess an existing information system for byumba sector. This study will also design and implement a system that will facilitate byumba sector to deliver public services online and allow citizens to book for appointments. This will allow byumba sector to achieve its objectives and service delivery

# 

# CHAPTER THREE

## 3.0 RESEARCH AND DESIGN METHODOLOGY

### 3.1 INTRODUCTION

The development of a system is a work which requires much attention and effort. The main goal of a new system is to satisfy the needs of users by solving problems faced with the existing system. Deep analysis of users’ needs will most of the time lead to a useful software development as a system might give perfect result. (Alan.D, 2007)

## 3.2 Data Collection Techniques

In programming, the methodology is defined as an organized documented set of procedures and guidelines for one or many phases of software life cycle, such as analysis or design. The following techniques and methods were used in BSC

### 3.2.1 Documentation

This method is to read documents about what you need to research without talking to anybody. This was the main method used while collecting all information required to private companies and market publishing. Consulting documentation around the world has been one of the favorite techniques used to carry out this research work. (Grad, 2016)

### 3.2.2 Internet Research

This is the method to collect data where you search information on internet what people are doing and how they do things. I used this method when I visited the social media and other online research like (Grad, 2016)

### 3.2.3 Interview

The technique of interview is a formal meeting in person used gathers information or facts about a specific subject. This technique has been helpful in terms of information gathering. I had an interview with technical department, business department of BSC ltd. They explained me all process done to publish the market and all process done till the required goods or services is delivered or supplied. (Grad, 2016)

### 3.2.4 Observation

This is the method to collect data where you observe what people are doing and how they do things, is also process of recording the behavior of people, object and occurrences without questioning or communicating with them. I used this method when I sited in the Technical department and in the Sales department, I learnt much from that time about how they prepare to publish their market. (Grad, 2016)

## 3.3 Software Engineering Methods

The waterfall model is the system development methodology that used during the development of online market publication system’s web application for managing online market publishment in sale department.

The waterfall Mode refers to a linear-sequential life cycle model. In waterfall model, each phase must be completed fully before the next phase can begin. At the end of each phase, a review takes place to determine if the project is on the right path and whether or not to continue or discard the project. In waterfall model, phases do not overlap.

The waterfall model is a sequential design process, often used in software development processes, in which progress is seen as flowing steadily downwards through the phases of conception, initiation, analysis, design, construction, testing and maintenance. The figure below shows the sequence of phases followed in software development by using waterfall model.

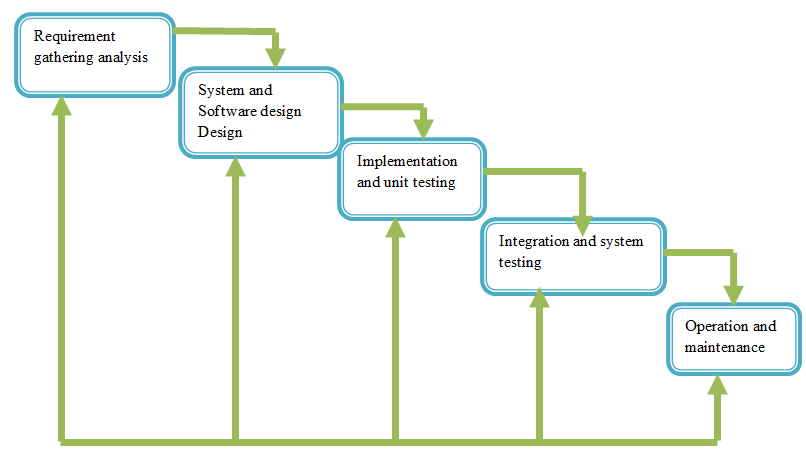
**Software lifecycle in waterfall model with the stages.**

The sequential phases in Waterfall model that are used in the development of this project are:

* **Requirement Gathering and analysis:**All possible requirements of this system to be developed are captured in this phase and documented in a requirement specification doc. example of the requirement are the data to be used.
* **System and Software Design:** The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The database and graphical interface of the project are developed here.
* **Implementation and Unit testing:** With inputs from this system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.
* **Integration and System Testing:** All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
* **Operation and Maintenance:** There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name "Waterfall Model". In this model phases do not overlap.

**Source**: Own drawing.

Figure 2: Waterfall model

### 3.3.1 advantages of waterfall model

1. Waterfall model is simple to implement and also the amount of resources required for it are minimal.

2. In this model, output is generated after each stage (as seen before), therefore it has high visibility. The client and project manager get a feel that there is considerable progress. Here it is important to note that in any project psychological factors also play an important role.

3. Project management, both at internal level and client's level, is easy again because of visible outputs after each phase. Deadlines can be set for the completion of each phase and evaluation can be done from time to time, to check if project is going as per milestones.

4. This methodology is significantly better than the haphazard approach to develop software. It provides a template into which methods of analysis, design, coding, testing and maintenance can be placed.

5. This methodology is preferred in projects where quality is more important as compared to schedule or cost

## 3.4 Organization of The Project

This project will comprise of five chapters, namely: Introduction, Literature review, research methodology, system analysis and design, conclusion and recommendation.

Chapter I, which has been presented above introduces the project elaborating its purpose, provides an overview of the currently status of digital divide in schools of Rwanda, and provides background knowledge on the topics and specific problems, the objective of the study, scope of the study and significance of the study.

Chapter II deals with literature review related to the topic

Chapter III deals with the research Methodologies and techniques used

Chapter IV will focus on the technical aspect of the application and the presentation of the screenshots as forms of data entry and reports. And again we will explain the new system focusing on how the application has been conceived, as well as the technologies used to build the software.

Finally, Chapter V will conclude our project as well as recommendations for future development.

## 3.5 SYSTEM SPECIFICATION

### 3.5.1 HARDWARE SPECIFICATION

### Hardware specifications

Here, the hardware specifications which must hold in order to use this system are the following.

* A computer with the following specification:
* 1 Ram 1.6 GB
* Ethernet card and internet connection
* 1 Processor 1.60 GHZ
* Hard disks 1 GB

### 3.5.2 Software specifications

* windows operating system
* A windows-based server application that is responsible for accepting HTTP request.

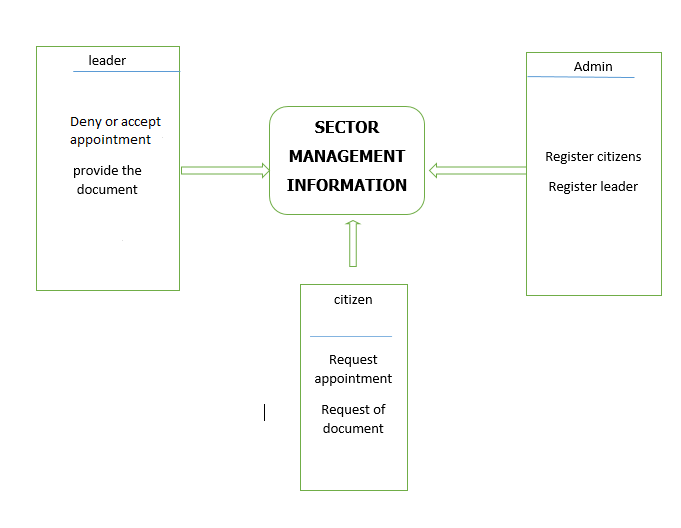
The package must be including: Apache 2.2,11, MYSQL 5.1.30, and php vision 4 or 5.

* PhpMyAdmin version 3.1.1 for database management.
* Ethernet Card and internet connection.
* Windows and lunix operating system
* Web client

## 3.6 Functional Requirements

1. The system will provide interactive user interface
2. The system will provide the database to store citizens records
3. The system will allow the citizens to create account
4. The system will allow the citizens to request the document online
5. The system will allow the citizens to book appointment with their leaders
6. The system will allow the leaders to accept or deny the appointment
7. The system will allow leader to provide request document to the citizen online

## 3.7. CONTEXT DIAGRAM



## Figure 2: CONTEXT DIAGRAM

3.8DATA FLOW DIAGRAM

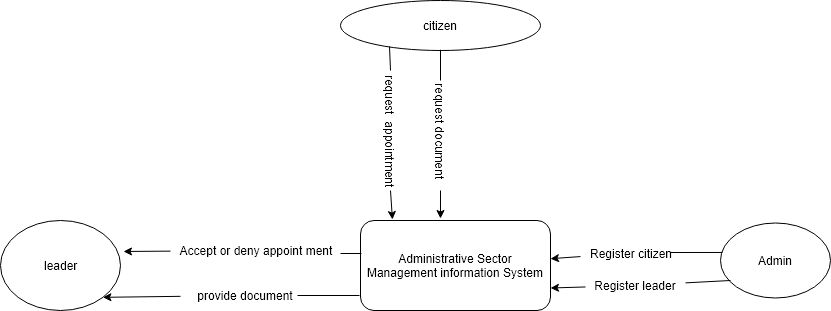


Figure 3; Dfd level0

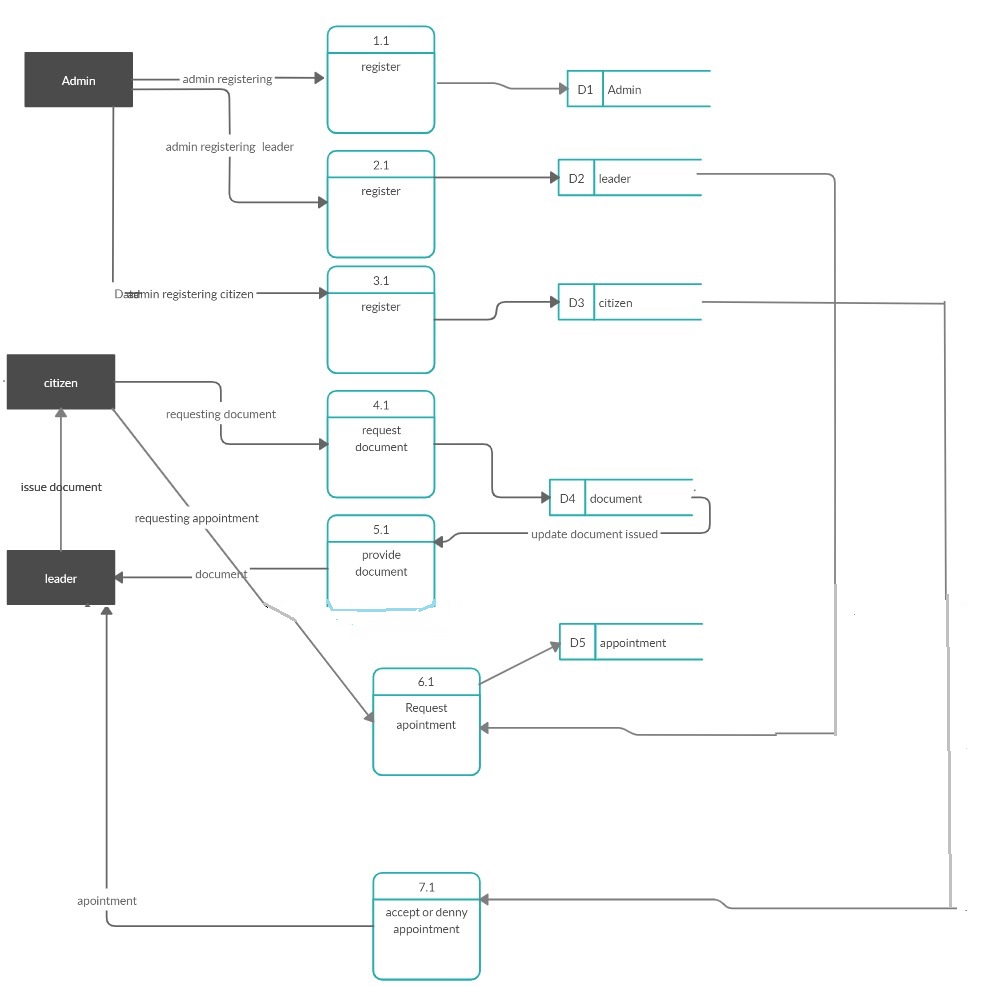
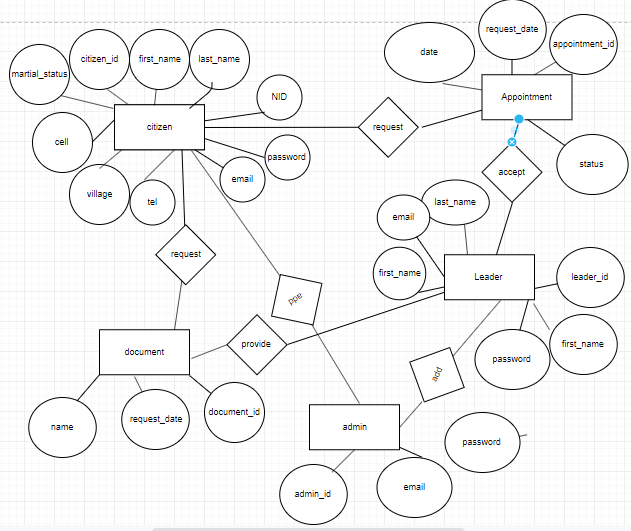


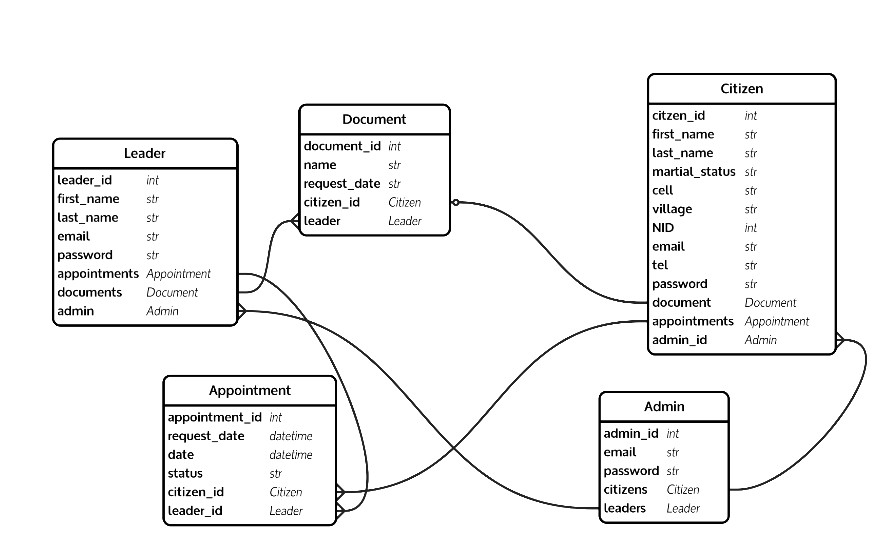
Figure 4; Dfd level1

## 3.9 ENTITY RELATIONSHIP DIAGRAM

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## 3.10 PHYSICAL DATA MODAL (PDM)

This model diagram illustrates the organization of data in the database that stores data for the database system. It describes all the details and the relationship between the tables that make up the database.



## 3.11 DATA DICTIONARY

|  |  |  |
| --- | --- | --- |
| Table 1 **citizen** | | |
| **FIELD** | **DATATYPE & SIZE** | **INTEGRITY** |
| Citizen\_id | Integer | Primary key |
| First\_name | Varchar(45) | Not null |
| Last\_name | Varchar(45) | Not null |
| Cell | Varchar(255) | Not null |
| Village | Varchar(255) | Not null |
| Email | Varchar(255) | Not null |
| Martial\_status | Varchar(255) | Not null |
| NID | Varchar(255) | Not null |
| password | Varchar(255) | Not null |
| Admin\_id | Int(25) | Foreign kry |

|  |
| --- |
| Table 2**leader** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Leader\_id | | Int(11) | | | Primary key | |
| First\_name | | Varchar(255) | | | Not null | |
| Last\_name | | | Varchar (255) | | Not null | |
| Email | | | Varchar (255) | | Not null | |
| password | | | Varchar (255 | | Not null | |
| |  |  |  | | --- | --- | --- | | Table 3: | **document** |  | | Document\_id | Int(11) | Primary key | | Name | Varchar(45) | Not null | | Request\_name | Varchar(255) | Not null | | Citizen\_id | Int(25) | Foreign key | | Leader\_id | Int (11) | Foreign key | | | | | | |
| Table 4: | **appointment** | | |  | |
| Appointment\_id | Int(11) | | | Primary key | |
| Date | date | | | Not null | |
| Request\_date | Varchar(255) | | | Not null | |
| Status | Varchar(255) | | | Not null | |
| Citizen\_id | Int(11) | | | Foreign key | |
| Leader\_id | Int(11) | | | Foreign key | |

|  |
| --- |
| Table 2**admin** |

|  |  |  |  |
| --- | --- | --- | --- |
| admin\_id | Int(11) | | Primary key |
| Email | Varchar(255) | | Not null |
| password | | Varchar (255) | Not null |

## 3.12 Tools and languages to be used in software development

### HTML

Hypertext Markup Language (HTML) is a markup language designed for creating web pages, that is, information presented on the World Wide Web. Defined as a simple "application" of SGML, which is used by organizations with complex publishing requirements, HTML is now an Internet standard maintained by the World Wide Web Consortium (W3C). The most recent version is HTML 4.01, though it has been superseded by XHTML.

### PHP

Acronym: Hypertext Pre-processor. PHP is a server-side scripting language for creating dynamic Web pages. You create pages with PHP and HTML. When a visitor opens the page, the server processes the PHP commands and then sends the results to the visitor's browser. PHP is Open Source and cross-platform. PHP runs on Windows NT and many UNIX versions.

### CSS

Cascading Style Sheets (CSS): A style sheet language used to describe the presentation of a document written in a markup language. Its most common application is to style web pages written in HTML and XHTML, but the language can be applied to any kind of XML document. CSS is a W3C Standard.

### MySQL

MySQL is an open source relational database management system (RDBMS) that uses Structured Query Language (SQL), the most popular language for adding, accessing, and processing data in a database. Because it is open source, anyone can download MySQL and tailor it to their needs in accordance with the general public license.

### Apache web server

Often referred to as simply Apache, a public-domain open source Web server developed by a loosely-knit group of programmers. Apache has been the world’s most popular web server (HTTP Server) on the internet since April 1996 and is generally considered to be more stable than other servers.

The original version of Apache was written for UNIX, but there are now versions that run under OS/2, Windows and other platforms.

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