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UNIVERSITY OF NAIROBI

# DOCTORS BOOKING APPOINTMENT APPLICATION



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PROJECT SUPERVISOR

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THIS PROJECT PROPOSAL IS SUBMITTED TO THE SCHOOL OF COMPUTING AND INFORMATICS

#### Submitted in partial fulfillment of the requirements of the diploma in computer science

I, Abednego Kilonzo, do hereby declare that this project is my own work, and per my knowledge. It has not been submitted to any other institution of higher learning.

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This project has been submitted as a partial fulfillment of requirements for diploma in computer science of the University of Nairobi with my approval as the supervisor

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Signature …………………………………………………………………….

Date ……………………………………………………………………..

# ABSTRACT

Currently hospitals accept their patients in a daily basis. They come to visit the hospital and are booked in by the available secretaries and then they are queued in for appointments to see doctors. Some disease you just want to see the doctor or regular basis and every day going a queuing to wait for an appointment and fail to meet the doctor can be very discouraging.

That time spend waiting can be saved in doing other things and then come to see the doctor later. This project aims to solve this problem by enabling people book for appointments with doctors for various diseases which are not usually too urgent.

# ACKNOWLEDGEMENT

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# CHAPTER 1

## 1. Introduction

## 1.1 Background study

The idea of a doctor’s appointment booker application:-

Over the past years technology has been in a rampant increase from hardware and also software but the health sector has somehow lagged behind inclusively the doctors and patient interaction or a patient booking an appointment with a doctor for especially those whose do not have private doctors which are the majority. To get an appointment with a doctor you must go the specific health facility and place the appointment request which has some draw backs including:-

* Long waits for the patients only at the end of it not getting to see the doctor.
* Failure to find a doctor in the health facility.
* A doctor failing to meet a specific appointment that they had reserved either as a result of forgetting.
* Favoritism in the health facility in booking of doctor appointments.
* Over burdening a specific doctor with too much work for them.

These and many others cause the current manual system to be ineffective and poor service delivery the involved parties.

The number of people needing health care is increasing becoming huge and sometimes need more than human effort to perform the task of booking appointments. This doctor appointment application will to some extend solve the current situation. This will enable patients specifically make a appointment prior to time enabling the following both doctors and patients to come into consensus where both will not be adversely affected.

## 1.2 Problem Definition

In many hospitals all around the country there exist a manual system in booking of appointment where the patient or the individual that wants to see a doctor must visit a certain health facility and place an appointment which can either be successful, in that the doctor can see the individual based on the work load onto the doctor. This means that they use physical documents to store the appointment consuming space and resources that could be done away with when this application is introduced.

## 1.3 Objectives

1. To help individual view various hospital and the doctors details & live availability
2. Help individuals/patients book appointments

## 1.4 Problem Justification

The application will be of help if developed because:-

1. The application will help individual book appointments.
2. Doctors will be able to see their appointments.
3. The application will help doctors schedule their time and appointments based on the appointment request made
4. This will also improve a doctor’s image since a doctor can fill in his specialization and help doctor to patient interaction.

## 1.5 Project Scope

The application on completion will have the following modules:-

* The registration and login of both doctor and other individual where you select if you are a doctor.
* The doctor preview module where can view details of a specific doctor and the days and time when one can book an appointment
* The appointment booking module, which help one book an appointment with a selected doctor.

# CHAPTER 2

## 2.0 LITERATURE REVIEW

There has been a very manual way that is in place to help patient and doctor interactivity which has led to some individual or organization think of putting in place measures to bridge this gap. This has been through web systems application and phone applications. These systems are only for private organizations or cover limited scope of the general public.

There has been less innovation to cover both scopes of private and public organizations thus patients or the general public cannot be able to view doctors know more about hospital and what is offered by various hospitals.

Some Include:-

1. **SetMore(Free Online booking Appointment)-**this enables individual book appointments and notification are send to various parties via SMS.

The difference between my application is that:-

* You can view various hospital based on a county and based on specialization and book appointments.

1. **Zoho Doc.** this is a web system that helps in booking appointments but their a likehood that people will visit a n application more than a websysem.

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# CHAPTER 3: METHODOLOGY

### 3.0 Developing model

The methodology used to develop the system was the SSDM using waterfall model. The idea of the waterfall model is to clarify the requirements of each stage before proceeding to the next. There is no alteration of the previous phase after moving to the next phase. The refinement is done after the project is complete in the next iteration of the project.



The reasons and the advantages of using the following methodology for the project development are

* This model is simple and easy to understand and use
* It is easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process
* In this model phases are processed one at a time phases do not overlap
* It works well for smaller projects where requirements are well understood

However, the waterfall model has some shortcomings such as

* No working software is produced until late during life cycle
* You need to work on every detail about an aspect before going to the next.

## REQUIREMENT ELICITATION

According to the waterfall model, Requirements Engineering is the phase in which the software requirements are acquired, analyzed, validated and a formal specification of them is produced. This phase is usually preceded by another one known as Market Analysis which defines the context for the Requirements Engineering phase. Finally, Requirements Engineering is succeeded by the Design Phase which is concerned with specifying the software solution to the requirements specification.

The popularity of the waterfall model lies in its principle that each of the phases are autonomous and can produce their deliverables using only the deliverables of their immediate predecessors, which guarantees that each phase can be completed and yield a specific outcome.

The waterfall model views Requirements Engineering as a comprehensionphase

## 3.1 Resources

The project was developed using the following resources

Software

1. Microsoft windows 10
2. Sublime text 3 for the web platform
3. Wamp 2.5 server for php and mysql database
4. Android Studio 1.5.1 for the android application part.

Hardware

The system was developed using a Taifa core i3 black laptop with the following features

1. 500GB hard disk
2. 3.88 GB usable RAM
3. 64 bit operating system
4. Intel® core™ i3-3110M CPU @2.40GHZ

# 4.0 SYSTEM ANALYSIS

## 4.0 FEASIBILITY STUDY

### 4.0.1 Introduction

The feasibility study was done to system to determine and understand the system requirements adequately. Some tool used to gather the information were the Wide World Web (www) and talking with various people on the viability of the idea (intervies). The following were the results:-

### 4.0.2 Economic Feasibility

The application was weighed and it was found out that an android account and a webserver to host the database and the scripts was need which was approximately 3,000 Kshs annually.

### 4.0.3 Technical Feasibility

The necessary technology to implement the system was in place and the tools available which include a online webserver, an android smart phone, and database.

## 4.1 REQUIREMENTS ELICTATION

The requirements of the new system were gathered and the constraints understood. The requirements were as follows:-

### 4.1.1 FUNCTIONAL REQUIREMENTS

The new application required an interface in the android part for patients to interact with and a web

system to enable the administrator and the doctors panel.

#### 4.1.1.1 Patients Panel

You need to register to the application as a patient in order to be able to book an appointment with a doctor in a given cartegory.

#### 4.1.1.2 Doctors Panel

Register as a doctor and you can be able to see your appointments based on the day of the week as required. You can also see the patients name and some small details that they specified when they were booking the appointment with that specific doctor.

#### 4.1.1.3 Administrator Panel

The administrator can be able to register a hospital or deregister it .

### 4.1.2 NON FUNCTIONAL REQUIREMENTS

#### 4.1.2.1 SECURITY REQUIREMENTS

The application will enable user create a user name and set a password which they will use in logging in and out of the application. Doctors have their own registration and account logging in different from other users.

#### 4.1.2.2 SYSTEM CONSTRAINTS

The application can be integrated with an available hospital system to enable send appointments in the queue to enable also the receptionist see what other appointments have been booked except the daily bookings that are made in the morning.

## 4.2 USE CASES

The following use cases were to for the purpose of system analysis.

### 4.2.1 Patients use case

new user already a user(patient)

**new doctor registered doctor**

**The application administrator**

# 

# CHAPTER 5

# 5.0 SYSTEM DESIGN

## 5.1 The architectural model

The proposed application architectural model is shown below:-

medicare

Data Base

Patients

Module

Doctors Panel

Module

Hospitals

Module

## 5.2 CONTEXT DIAGRAM FOR medicare APPLICATION

Register as a patient

See Appointmets

Book appointments

Update System

See Appointmets

De/Register Hospital

See Appointmets

Administrator

See doctor appointments

See Appointmets

Register as a doctor

Medicare

Application

Doctor

Applicant as a normal Person/Patient

## 5.3 Level 1 diagram of the medicare application

REGISTERING PROCESS

PATIENTS/

DOCTORS

Registration Details

PATIENTS &DOCTORS

Registration Details

Registration status

BOOKING PROCESS

Booking Details

Appointment Details

PATIENTS

Booking status

Login Details

VIEW APPOINTMENTs

DOCTORS

## 5.4 Level 2 diagram of the medicare

### 5.4.1 Doctor Booking Appointment Process

Patient’s details

Login Status

REGISTERED USERS

Login Processing

Doctor Book Processing

Appointment Details

Booking Details

Patients Details

Booking Details

### 5.4.1 Doctor Viewing Appointments

Booking Details

Patient’s Booking Details

REGISTERED DOCTORS

Login Processing

Doctor Viewing Appointments

Doctor Details

Login Status

Login Details

## 5.5 Sequence Diagrams

### 5.5.1 Patient Registration

Validation

Registration

Database

User Details

Invalid error

Details if valid

Registration successful

Patient’s Details

success

### 5.5.2 Patient/Admin/Doctor Login

Validation

Logging In

Database

User Details

Invalid error

Details if valid

Login successful

Patient’s Details

success

### 5.5.2 Bookng Appointments

Validation

Booking Appointments

Database

User Details

Invalid error

Details if valid

Appointment Booking successful

Patient’s Details

success

## 5.7 Normalization

The database was normalized using the three normal forms. This ensured that the database was free from data redundancy and undesirable characteristics such as insertion, update and deletion anomalies

### 5.7.1 First normal form

This ensured that no two rows of data contained repeating group of information. Each table was organized into rows and each row had its primary key

**For example the Hospitals table**

|  |  |
| --- | --- |
| Hospital Id | Hospital Name |
| 1 | Kisani Hospital Unit |
| 4 | Muthaiga Care Unit |

### 5.7.2 Second normal form

This ensured that there was no partial dependency of any column with the primary key. Each column in the table was to depend upon the primary key in this form

This implies that if there exists a partial dependency of a column with a concatenated primary key, i.e. the column only depends on one part of the key, and then the table fails the second normal form.

Appointments

Appointment Id

Patient ID

Doctor ID

Disease Id

Appointment Date

Description

Doctors

Doctor ID

Doctor Name

Hospital ID

Specialization

Hospitals

Hospital ID

Hospital Name

Hospital Location

Diseases

Disease Id

Disease name

Disease Description

Patients

Patient Id

Patient name

User Name

password

Administrator

Admin Id

Admin Names

### 5.7.3 Third normal form

This was done to ensure there was no transitive functional dependency in the tables.

For example in the table assessments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Appointment ID | Disease Id | Doctor Name | Appointment Date | Disease Description |

In this table, the Disease Descrtiption and Disease ID have a transitive functional dependency with the primary key assessment number. In order to normalize the table in third normal form they have to be moved to another table. In the third normal form the following tables were made from the above table

Appointment Table

|  |  |  |  |
| --- | --- | --- | --- |
| Appointment | Disease Id | Doctor Name | Appointment Date |
|  |  |  |  |

Fund usage table

|  |  |  |
| --- | --- | --- |
| Disease Id | Disease Catergory | Disease Description |
|  |  |  |
|  |  |  |

# 6.0 IMPLEMENTATION AND TESTING

## 6.1 IMPLEMENTATION

### 6.1.1 HARD WARE IMPLEMENTATION

The android application will run on an hardware which is an smart phone running with Android Operating System.

The phone should have:-

1. A version of Android Operating System should 4.0(KitKat) and higher.
2. A RAM of 512 Mb and higher.
3. Internal memory of 512 and higher
4. 2G or higher network support.

### 6.1.2 SOFT WARE IMPLEMENTATION

The system has been developed on the XAMPP server for the back-end. XAMPP is a free and open source cross-platform web server solution stack package consisting of the apache HTTP server, My-SQLi database and interpreters for scripts.

The Programming Languages used include the following:-

* PHP for server side scripting or the back-end.
* Android Programming Language for the front-end.
* JSON for Interaction and data exchange between the PHP-Android Interface.

The other Software used includes the following:-

* Sublime Text 3.0
* Android Studio 1.5.1
* cPanel server for online hosting of PHP scripts.

## 6.2 TESTING

The testing was done later according to water fall implementation development methodology.

### 6.2.1 UNIT TESTING

This was done to the smallest testable unit in each module.it involved black-box and white-box testing Technique.

Booking module:-

* making a booking with a specific doctor

Registation of Users:-

Adminstrator Module:-

### 6.2.2 PERFORMANCE TESTING

the performance test was done with different various mobile phones for the android application part the following changes were made:-

1. A proper User Interface for different screen sizes to enable readjusting accordingily.

### 6.2.3 INTERGRATION AND TESTING

After the development of the individual module, they were put together so that the application was working correctly. All the module were checked for data exchange even between server.

### 6.2.4 TEST CASES

Test case we developed to check the system efficiency and correctness of the system. The following below is the table of the test

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test case | Module | description | input | Expected results | Actual outputs |
| 1 | Appointment Module | User authentication | INVALID | Error message | Invalid credentials message |
| VALID | Proceed to application platform | A new window for the user appears |
| Booking Appointment | INVALID | Prompt the user to input correct details | An invalid input message |
| VALID | Proceed to the next form to be filled | A new form to be filled |
| 2 | Doctors Module | authentication | INVALID | Error message | Invalid credentials message |
| VALID | Proceed to the confirmation platform | A new window for the chiefs appears |
| View Appointments | Click on View Appointments button | You view appointments | The view appointments are removed from list |
|  | VALID | Proceed to the group approval platform | A new windows for the allocators appear |
| Group approval | Click on approval button | The group approval status changes to approved | The group appears in the approved groups list |
| Click on reject button | The group approval status changes to rejected | The group appears on the groups to reapply list |
| Group allocation | Allocate more than 500,000 | Error message | Invalid amount message appears |
| Allocate less than 50,000 | Error message | Amount less than minimum message appears |
| Allocate more than amount applied | Error message | Invalid amount message |
| Valid amount | Successful message | Group appears in the allocated groups list |

### 6.2.5 Cross Mobile Android Platform

The mobile application was tested in various supported version of android operating system and the results were that it was fully compatible with them including the different manufactures in the market.

### 6.2.6 Cross Browser compatibility testing

Since the administrator work on a web module to enable the correct functionality different browser were used to test for compatibility and it worked well for:-

* Mozilla Firefox
* Google Chrome
* Internet Explorer 11

# CHAPTER 7

## 7.0 CONCLUSION

## 7.1 Achievements

The application after the development process was complete and ready to released in the market having completely accomplished its requirements as stated in the object at the initial development phases.

The application solves different problems that user faces in hospitals of long queue and failure to be have an appointment with a doctor. The process has been automated to help to book advance appointments.

## 7.1 Recommendation

1. The system should be interfaced with existing hospitals systems for easy appointments booking.
2. The system can be interfaced with the existing platform that are used by the patients to view doctors details and enable the viewers booking with that doctor.

# CHAPTER 8

## 8.0 REFEENCES

In the development of this application the following references were:-

1. [www.3schools.com](http://www.3schools.com)
2. [www.tutorialspoint.com](http://www.tutorialspoint.com)
3. http://developers.google.com
4. [www.simpliedcoding.com](http://www.simpliedcoding.com)
5. Zoho Doctor Pane

# CHAPTER 9

9.0 APPENDIECIE