Health Care Application

By

Sabrina Sattar ID: 151-15-4756

Muntaha Mashrafi ID: 151-15-5078

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

Prof. Dr. Syed Akhter Hossain
Professor & Head
Department of Computer Science & Engineering
Faculty of Science and Information Technology
Daffodil International University

Daffodil International University

Dhaka, Bangladesh

December 2018

APPROVAL

This Project titled **"Health Care Application"**, submitted by Sabrina Sattar, ID No: 151-15-4756 and Muntaha Mashrafi, ID NO: 151-15-5078 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 11 December, 2018.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain — **Chairman**
Professor and Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. Sheak Rashed Haider Noori — **Internal Examiner**
Associate Professor& Associate Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Md. Zahid Hasan — **Internal Examiner**
Assistant Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. Mohammad Shorif Uddin — **External Examiner**
Professor
Department of Computer Science and Engineering
Jahangirnagar University

DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Prof. Dr. Syed Akhter Hossain, Professor and Head**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for any award of any degree or diploma.

Supervised by:

_____

Prof. Dr. Syed Akhter Hossain
Professor and Head
Department of Computer Science and Engineering
Faculty of Science and Information Technology
Daffodil International University

Submitted by:

_____

1. Sabrina Sattar
ID: 151-15-4756
Department of Computer Science and Engineering
Daffodil International University

_____

2. Muntaha Mashrafi
ID: 151-15-5078
Department of Computer Science and Engineering
Daffodil International University

ACKNOWLEDGEMENT

At first we express our thanks and gratefulness to Almighty Allah for His divine blessing has enabled us to finish our final year project successfully.

We also feel grateful and indebted to our Supervisor **Prof. Dr. Syed Akhter Hossain, Professor and Head**, Department of CSE, Daffodil International University. His deep knowledge has influenced us. His endless patience, his constant guide, encouragement, constructive criticism has helped us to finish our project.

We would like to express our heartiest gratitude to **Prof. Dr. Syed Akhter Hossain, Professor and Head**, Department of CSE, for his kind help, instruction and counseling to finish our project and also the teaching of other faculty member and the staff of CSE department of Daffodil International University.

Also all of our teacher and instructor in Daffodil International University have helped us in various stages.

Finally, our parents and siblings who have always been with us during this journey, we acknowledge with due respect to their constant support and patients.

ABSTRACT

In 21st century information technology is playing a vital role in our everyday life. One of the important arenas is health care. Due to rapid changes in environment and industrial progress health care has become much more important than before. This project "Health Care Application" is conceived from needs. The title of our project is "Health Care Application". This is an android based application which will help the women and babies to reduce their various health care problems by offering them various solutions. The aim of this application is to provide health care service to the women and babies of our countries. Here they can search for disease symptoms and will receive information about primary treatment. In case their problem is severe we will provide nearby hospital's information. Also many common disease treatments are provided here for everyone. Different types of nutritional advice for different disease, vaccine list, child care is also provided here. The user will also be able to comment and enquiry about their disease where solution will be provided by a professional. The essential tools for building this project is a computer and android studio for XML and Java. We also need an android phone to test & evaluate our application. We used firebase for the data storing which is a Google's mobile platform that helps you to develop high-quality apps quickly. In the future AI will be incorporated into the project to facilitated better service to the end user.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Introduction

This application is an android based application which provides Health Care Service where the main focus is women and baby health care. Here they can search for disease using symptoms which will provide them an approximate disease with primary treatment and for further treatment doctor's information. It will also provide hospital address, vaccine list, nutritional advice and baby care. They will also be able to enquiry about their disease.

1.2 Motivation

The girls and women of our country face many health problems in their daily life. Usually they feel shy to share it with even their family members. They hesitate to consult with doctors. They often take wrong medication by their own, which may increase their problems and harmful for their health.

There is a big issue with the pregnant women and newborn baby health in our country. The pregnant women often don't know how to take care of their health and proper nutrition or initial treatment at this critical time. Our new mothers often deal with a great dilemma with their newborn's sudden problems. They don't even know which doctor to consult with. It is a big challenge to care their newborn with a proper nutrition.

That's why we propose such a mobile application which will help the girls, women and new mothers to have a proper nutrition and medication. It also helps them to find nearest doctor and hospitals.

1.3 Objective

1. To identify the approximate disease.

2. To find out the initial medicine suggestion.

3. To find out proper nutrition for different disease and how much you should take them.

4. To find out the vaccine schedule for women and babies.

5. To find out nearest hospital.

1.4 Expected Outcome

Our expected outcome is to make Health Care Platform which will help the women and babies, it will also help the women to find solution for their problem when they are unable to describe their problem or confide in others. Also other people will be able to find solution for their common problem. It will also save time and money.

1.5 Report Layout

Chapter 1: The introduction, motivation, objective and expected outcome are described in this chapter also the reason for building this project.

Chapter 2: The information about the background of the application is described in this chapter. Also related work and what we have studied for this application. The challenge and scope of the problem is also included here.

Chapter 3: This chapter started with information about business process model (BPM). The Use case model is added with explanation. The requirement collection and analysis is also described in this chapter.

Chapter 4: All the design process is in this chapter like font-end design, back-end design, interaction design and UX and the last thing of this chapter in implementation requirement.

Chapter 5: This chapter included information about the implementation of database, front-end designs, implementation and interactions, testing implementation and the test results of the project.

Chapter 6: We have talked about the conclusion, limitation and scope of further problem in this chapter.

CHAPTER 2

BACKGROUND

2.1 Introduction

From early day's health care is a very important topic among human. Our project will be an android based application which can be operated by Smartphone. Our main goal is to provide service to women and children. Sometimes they face such situation where they are unable to connect with doctor but they need instant solution. Our application will provide help in such situation and will try to reduce their problem.

2.2 Related Works

When we get the rough idea to build our application we research about similar types of android application in the Google play store. We have analysis the functionalities of the similar types of application and tried to find out the unique feature of our application. We have found out that most of the application has features which contain disease with their treatment, but there are no ways to find out about people's specific disease. Very few applications put emphasis on female's disease.

2.3 Comparative Studies

After observing many applications in the app store in Health Care Application our concern is women health. We will also use symptoms to find out the approximate disease then we will provide primary treatment according to disease. They don't have to sign up or log in to find out disease. If they want to ask any question or enquiry about any disease, then they have to log in. We have used apps like "Ada", Quality Health Care for our comparative study.

2.4 Scope of the Problem

We have one feature in our application where the user can ask question. Some application provides real time chatting system. But it is very difficult to do. On the other hand, many diseases have almost same types of symptoms. Also many people are illiterate and sometimes even educated people don't know how to identify the problem or symptoms. There is a great amount of diseases

in the world; we cannot work with all of them. Neither we have the knowledge about the diseases nor do we have the expertise to build such a huge application.

2.5 Challenges

Our first challenge was learning all about android application development. We also want a professional to answer the questions of our user. Also one of the big challenges was to build a database which will produce correct disease since some of the diseases have same symptoms. Also we faced many technical difficulties in the android studio.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Model

Business process modeling or BPM is an engineering system and the mobility of the representing method of an enterprise so that the current process may be analyzed, improved and automated [1]. It is performed by the business analysts who provide the expertise modeling system. Process model can be grown directly from event's log by using process mining tools. In this application the entities are all kinds of people of all age mainly women. They can search for any disease information using symptoms. They can also look for vaccine list, nutritional advice, nearby hospital address etc. They can add any prefered doctor's information and make a list. They can also comment and add any query. They have to sign up and login for using these facilities. They also can calculate their BMI using their height and weight.

3.2 Requirement Collection and Analysis

Some requirements of the project are given below:

1. Correct disease symptoms for the best approximate result.

2. Needed registration to use comment/enquiry, add doctor etc.

3. Must need a valid email address to complete the process of registration.

4. Correct information about vaccine list, nutritional advice.

5. Correct information about height and weight to calculate BMI.

6. Professional physician is needed as an admin to answer the question of the user.

After finding out main objectives, requirement analysis was adopted using different tools such as use-case diagram.

3.3 Use Case Modeling & Description

Use case model of the user is given below in figure 3.3.1

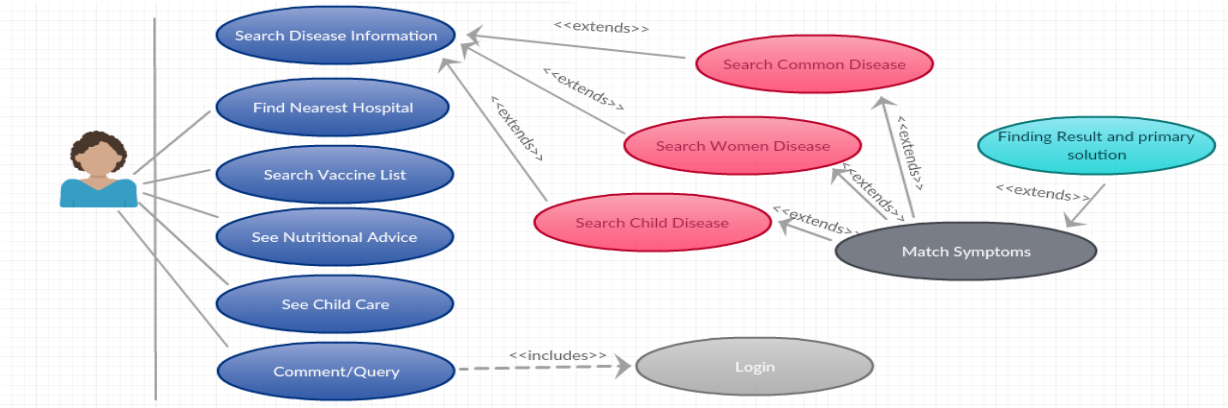

Figure 3.3.1 Use Case Model for User

Use Case Description for User

In software and systems engineering, a use case is a list of actions or event steps typically defining the interactions between a role (known in the Unified Modeling Language as an actor) and a system to achieve a goal. The actor can be a human or other external system.

Use Case 01: Search Disease Information

Primary Actor: User.

Precondition: Internet Connection

Secondary Actor: Null

Main Success Scenario: Click the search disease button then you will see three options common, women and child disease. Select your required option and enter.

Exception Scenario: No data found because of specific disease is not in the database.

Use Case 02: Find Nearest Hospital

Primary Actor: User

Precondition: Internet Connection, Location Access.

Secondary Actor: Null

Main Success Scenario: Click the search disease button and select your area to find nearby hospital around you.

Exception Scenario: No data found because of internet connection or uploading problem.

Use Case 03: Search Vaccine List

Primary Actor: User

Precondition: Internet Connection

Secondary Actor: Null

Main Success Scenario: Click the search vaccine button and search your desired vaccine list according to women and child list.

Exception Scenario: No data found because of uploading problem.

Use Case 04: See Nutritional Advice

Primary Actor: User

Precondition: Internet Connection

Secondary Actor: Null

Main Success Scenario: Click the nutritional advice button and we will provide you nutritional advice and BMI calculation.

Exception Scenario: No data found because of uploading problem.

Use Case 05: Doctor profile

Primary Actor: User

Precondition: Internet Connection

Secondary Actor: Null

Main Success Scenario: Click the doctor profile button and the user will be able to add doctor.

Exception Scenario: No data found because of uploading problem.

Use Case 06: Comment/Enquiry

Primary Actor: User

Precondition: Internet Connection

Secondary Actor: Null

Main Success Scenario: Click the ask question button then you will need to sign up using your email after that you can comment or enquiry about your disease. After that a professional physician will answer about your concern.

Exception Scenario: No data found because internet connection and of uploading problem

3.4 Design Requirements

Our goal is to make our user comfortable while using the application because if the system runs smoothly our user will prefer the application over other method. Since the front end and back end play the main role to make a system perform smoothly we have followed these points while designing our system.

User Friendly: The application must be user friendly so that the user can search disease quickly and easily found their solution whether it is primary treatment or hospital's information.

Efficiency: To make the application efficient we have to make it as light as possible.

CHAPTER 4

DESIGN SPECIFICATION

A design specification is a detailed document providing information about the born of a project to set criteria the developers will need to meet [2]. Its use is called for where a structure or product has to be specially made to meet a need. De

Design Specification is a statement that how a design will be developed for a system. In the section of Design Specification, we are going to show the front-end and back-end design of our mobile application and admin panel. We will also discuss about many tools and platforms that we have used in this project.

4.1 Front-End Design

Frontend design involves creating the HTML, CSS, and presentational JavaScript code that makes up a user interface [3]. In our application there are two part of front-end design where one part in for the user and the other is for the admin.

We are going to discuss our front-end design:

Here in figure 4.1.1 we have shown our splash screen and in figure 4.1.2 the home screen activity of our application -

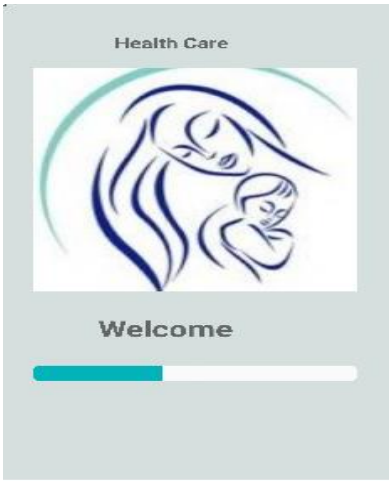

Figure 4.1.1: Splash Screen

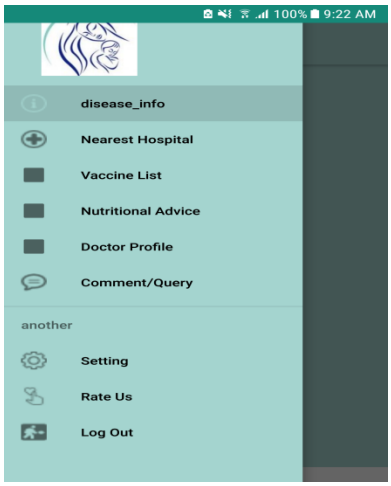

Figure 4.1.2: Home Page Activity

In figure 4.1.3 we have shown our disease search and in figure 4.1.4 we have shown our common disease search fragment –

Figure 4.1.3: Disease search fragment

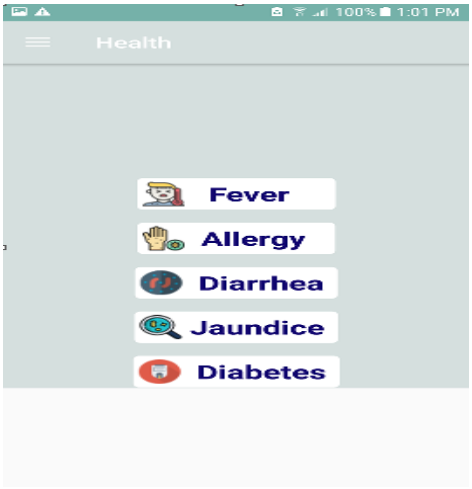

Figure 4.1.4: Common disease fragment

Figure 4.1.5 and Figure 4.1.6 shows the common disease digenesis and its information

Figure 4.1.5: Disease Digenesis

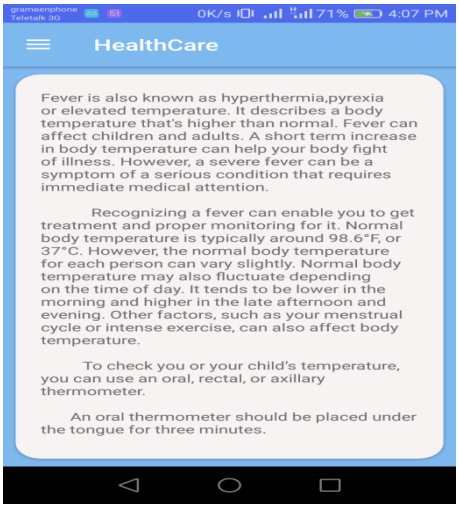

Figure 4.1.6: Disease Information

In figure 4.1.7 and figure 4.1.8 we are simultaneously show women disease and child disease fragment –

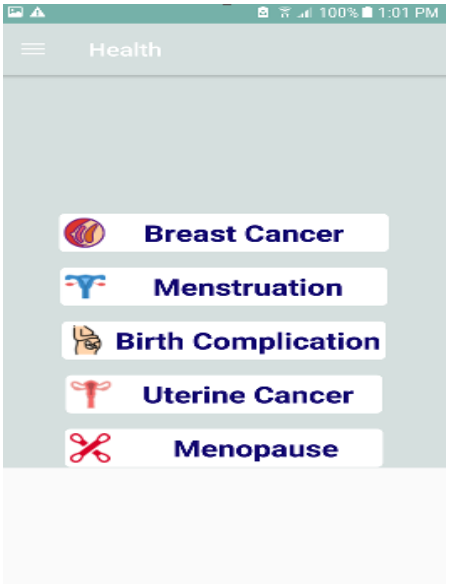

Figure 4.1.7: Women Disease Fragment

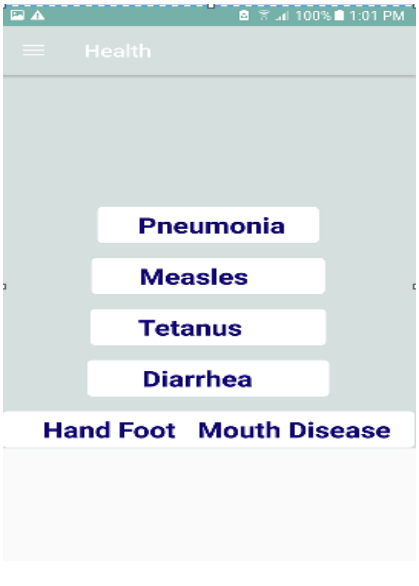

Figure 4.1.8: Child Disease Fragment

In this part we are going to show our nearby hospital fragment in figure 4.1.9 and nearby hospital search fragment in figure 4.1.10 -

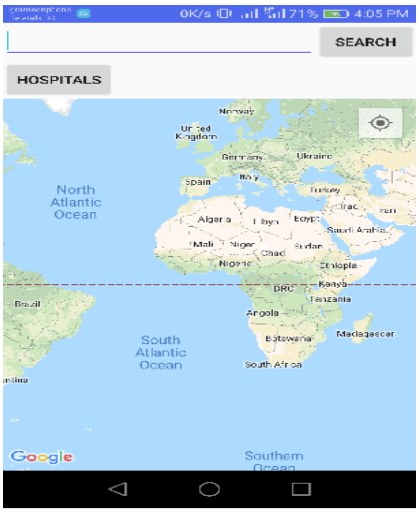

Figure 4.1.9: Nearby hospital fragment

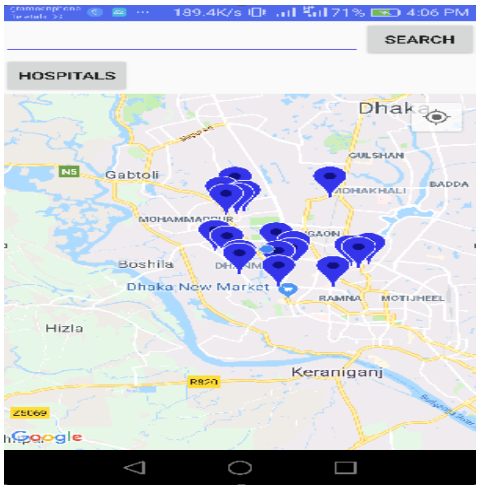

Figure 4.1.10: Nearby hospital search result fragment

In figure 4.1.11 and in figure 4.1.12 we are going to show our vaccine list and vaccine list result fragment simultaneously –

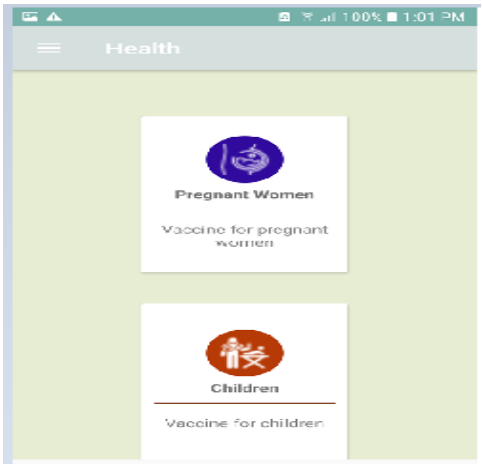

Figure 4.1.11: Vaccine list fragment

Figure 4.1.12: Vaccine list result fragment

We are going to show nutritional advice and nutritional advice result in figure 4.1.13 and figure 4.1.14 –

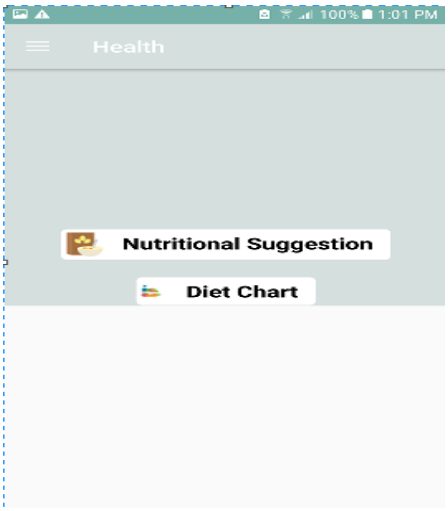

Figure 4.1.13: Nutritional advice fragment

Figure 4.1.14: Nutritional advice result

In Figure 4.1.15 and Figure 4.1.16 we are going to show the BMI calculation and BMI calculation result-

Figure 4.1.15: Nutritional advice

Figure 4.1.16: Nutritional Advice result

In Figure 4.1.17 and Figure 4.1.18 we are going show Doctor Profile and Comment fragment -

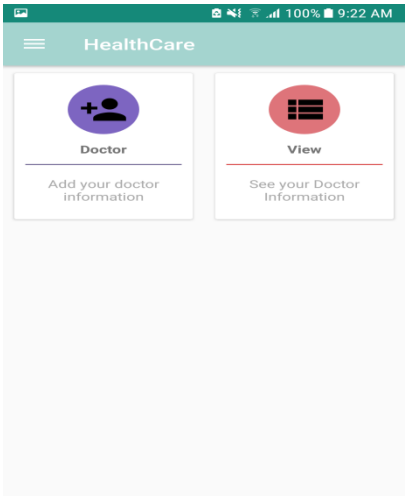

Figure 4.1.17: Doctor profile fragment

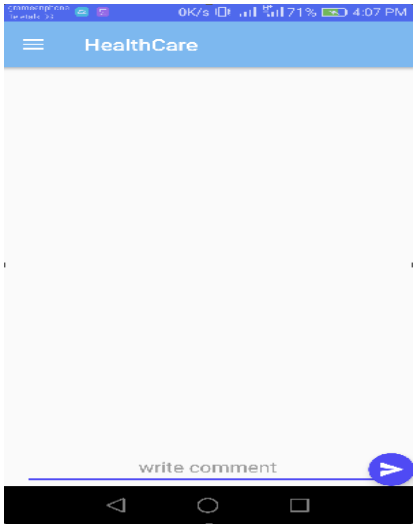

Figure 4.1.18: Comment fragment

In Figure 4.1.19 we are going to show login page where user can login-

Figure 4.1.19: Login page

4.2 Back-End Design

In an application in the back-end usually work as the logical part of the application. Since our whole system depend on it is the most important part of our application. The back-end consists of many factors which is different for different platform based application. In our application we developed it using XML, Java.

In the back-end various different tasks are performed for example data handling, third party system integration etc. The process of showing data is performed from the back-end. In the back-end data is stored as Jason. After user connects with the real-time database the user receives updates with new data instantly since it is a real time database

In our back-end we got all data of user and doctor's information. The information about comment are also going to be stored here.

In this application all of the information are stored in firebase and the all of the information are shown from there.

In figure 4.2.1 we are going to show authentication using email.

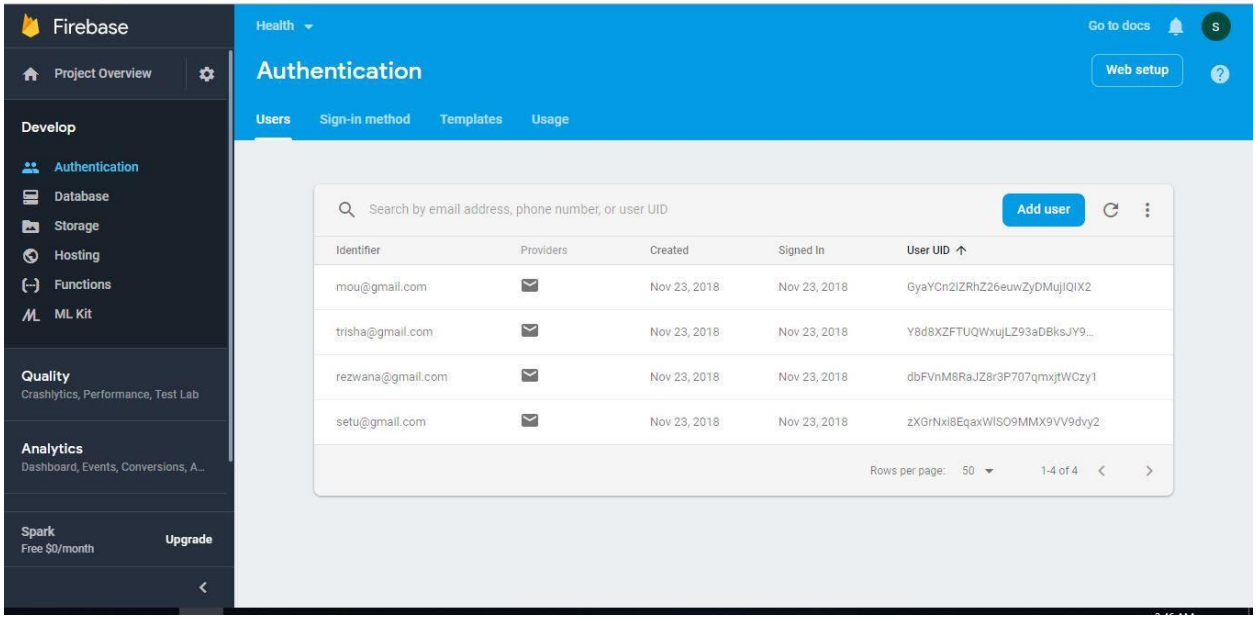

Figure 4.2.1: Authentication using email

4.3 Interaction Design and UX

Interaction design, often abbreviated as IxD, is "the practice of designing interactive digital products, environments, systems, and services." While the digital side of this statement is true, interaction design is also useful when creating physical (non-digital) products, exploring how a user might interact with it [4].

Using the process of Interaction design, we can understand the problem of user and solve the problem they faced during using the application. However, the interaction between the user and an application is how the user experience while using the application. Here the user interacts with the overall system and the admin.

For UX we have tested our application by several people. Most of them said that the user interface of the application is user friendly and useful while the other said that it needs more diversity in the disease.

4.4 Implementation Requirements

We need Android Studio to implement the project because we are going to use java and XML coding. To design the UI/UX we used Marvel. Since our application need to store data that is why we have used an online server firebase. Internet connection must be needed while using the server. Also location access is needed for usinf nearby hospital.

CHAPTER 5

IMPLEMENTATION & TESTING

5.1 Implementation of Database

Since we have used online mobile platform “Firebase” in our application for database we have connect firebase using the assistant window in android studio. Firebase is made up of complementary features that you can mix-and-match to fit your needs, with Google Analytics for Firebase at the core [5].

5.2 Implementation of Front-End Design

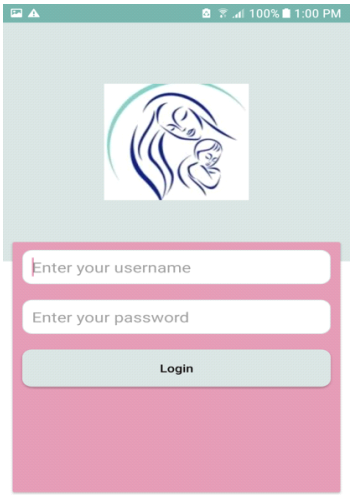

Figure 5.2.1 Login Page of the User

This is login page for both users. They have to input the mail address and the password. The email and password in stored in the database. The user cannot change anything

5.3 Implementation of Interactions

We have implemented responsive UI for the user’s ease of use. We have added icon, button so that the user can easily understand the function of our application. We have made our application in such a way so that the user can easily operate it.

5.4 Testing Implementation

System Testing is a procedure where a complete and an integrated system is tested to evaluate the system's interaction with the specified user requirements. This is important because by testing the tester will see the limitations or possibility of developing the system successfully.

5.5 Test Results and Reports

Here in table 5.5.1 we are going to show the test we have performed on the application and their result –

Test Case	Test Input	Expected Outcome	Obtained Outcome	Pass/Fail	Tested On
1. Login	Login by various browser	Login Successfully	Login Successful	pass	05-11-2018
2.Interface testing	Testing in various android devices	Perfectly tested in various devices	App is supported in all devices	pass	06-11-2018
3. ANR (Application is not responding)	Testing in various devices	Very rare not responding	Problem rate is very rare	pass	06-11-2018
4. Data Load	Data loading in the application	Data loaded successfully	Loaded successfully	pass	05-11-18
5. Hospital Search	Hospital search using Google Map	Hospital founded successfully	Hospital founded successfully	pass	05-11-18

6. Vaccine List	Vaccine list of women and children	Information founded successfully	Information founded successfully	pass	05-11-18
7. Disease Information	Various disease information	Information founded successfully	Information founded successfully	pass	05-11-18
8. BMI calculation	Calculation using height and weight	Result obtained	Result obtained	pass	05-11-2018
9. Internet access permission	Connect through application	Connected	connected	pass	06-11-2018
10.SDK testing	Checking in 11-22 SDK of version	Support in all version	Support in all version	pass	08-11-2018

Table 5.5.1: Test results and reports

CHAPTER 6

CONCLUSION & FUTURE SCOPE

6.1 Discussion and conclusion

We have gathered requirement based on practical scenario and implement it using android platform. Our main goal was to make an interactive android base application which will help the women of our country. This application will help them to detect common disease and disease which occur only to the women. We hope it will also raise their awareness about the disease symptoms and how to prevent them.

6.2 Limitations

- Only developed in Android platform.
- Some disease has same types of symptoms.
- We have to broaden our database.
- Need more functionality.
- Features such as notification, admin are needed to be included.

6.3 Scope for Future Developments

- Our goal is to make our application available in i0S and windows.
- We also want increase the data of our application.
- AI can be included for the user.

We will also think about more additional features which will be beneficial for the users

REFERENCES

[1] En.wikipedia.org. (2018). *BPM*. [online] Available at: https://en.wikipedia.org/wiki/BPM [Accessed 22 Nov. 2018].

[2] "Design specification", *En.wikipedia.org*, 2018. [Online]. Available: https://en.wikipedia.org/wiki/Design_specification. [Accessed: 22- Nov- 2018].

[3] "What is Frontend Design? Is that even a thing? – Prototype", *Prototype*, 2018. [Online]. Available: https://blog.prototypr.io/what-is-frontend-design-is-that-even-a-thing-3bafbf6c716e. [Accessed: 22- Nov- 2018].

[4] "Interaction design", *En.wikipedia.org*, 2018. [Online]. Available: https://en.wikipedia.org/wiki/Interaction_design. [Accessed: 22- Nov- 2018].

[5] "Connect to Firebase | Android Developers", *Android Developers*, 2018. [Online]. Available: https://developer.android.com/studio/write/firebase. [Accessed: 22- Nov- 2018].

[6] Wikipedia" XML, available at :https://en.wikipedia.org/wiki/XML last accessed on 22-10-2018 at 10pm

[7] "firebase" Database implementation, available: https://firebase.google.com/docs/android/setup [Accessed : 29-10-2018 at 3am]

[8] J. Horton, *Android Programming for Beginners*. Packt Publishing, 2015.

[9] D. Griffiths and D. Griffiths, *Head first Android development*. .

[10] M. Melissa Conrad Stöppler, "Prevention in Women: Heart Disease, Diabetes & More", *MedicineNet*, 2018. [Online]. Available: https://www.medicinenet.com/disease_prevention_in_women/article.htm. [Accessed: 22- Nov- 2018].

[11] "About Your Privacy on this Site", *Parents.com*, 2018. [Online]. Available: https://www.parents.com/health/the-10-most-common-childhood-illnesses/. [Accessed: 22- Nov- 2018].