Comprehensive Design & Analysis Project

4th Year 1st Semester

Software Requirements Specifications

Mobile Application with IOT

Project ID: 19-129

Project Coordinator: Ms. Shashika Lokuliyana

Submitted by: M. Pravienth (IT16048324)

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1. Introduction

This project is based on Health and Informatics. Our project title is "Detecting Anemia using IOT". It has four main implementation and main application element is implementing Mobile Application with IOT. The project based on the medical field and recognizing the disease via mobile application and the hardware instrument. The application which is used by specific doctors in the medical field related with Anemia disease.

1.1 Purpose

The purpose of the SRS is to specify the functionality, performance and interface requirements of the Mobile Application implementation in the project. All the required features expressed by client and agreed by the development side to implement the specific application to introduce the product-based application to the medical society.

1.2 Scope

The mobile application is named as "Doc-Detector". It is an android based mobile application for Anemia analysis doctors. The application offers various operations such as questions based on symptoms, details of Patients, viewing results of the disease level and the date of the next meeting session for the patient and doctors. These services are conveniently grouped and developed specifically for use on the Android device. All the operations can be performed when an internet connection is available. Administrator of the application can register the Doctor to the system to all services provided.

1.3 Definitions, Acronyms and abbreviations

SRS	Software Requirements Specifications
Android	Mobile Operating System developed by Google
GUI	Graphical User Interface
UI	User Interface

1.4 Overview

The next section, Overall description, of this document gives overview of the functionality of the application. It describes the internal requirements and outcome of each element. It is used to establish the context for these technical requirements specification in the overall description section.

The third section is about Specific Requirements. In this document, is written primarily for the developers and describes in technical terms the details of each functionality of the application.

The both sections of the document describe the terms of the software product in its main functionality, for the clients and audiences. The software related terms and functions are briefly mentioned in the both sections that is implementing the scope.

2. Overall Descriptions

The section describes the functions, aims and objectives of the mobile application of the project. It includes the constraints and requirements of the mobile application.

2.1 Product Perspective

The mobile application for Detecting Anemia disease which will useful for Doctors to maintain the statistics, specific disease affected patients, patients' specific details and the disease level updates. At the present there are two devices related to this main project but there is only a project includes the mobile application. It has only measurement details but no other details. In this project, the mobile application has all features that mentioned above. Earlier it is very difficult to contain the details of specific patient with Anemia disease.

In this project, includes all specific details and disease related ideas to reduce the level of disease. It mostly helpful for the doctors who maintain their details and updates about their disease level. It contains Anemia disease reduction level of each patient. The mobile application is going to build to helps to identify the patients separate and able to update their disease level once a month or twice a month. It is much easier to cure/ reduce the disease level.

In this application, admin registers the doctors only. Doctors will admit the patient's details to the application and it automatically saves in the database of the application. The doctor can update the patient's disease level with the help of hardware product. The questionnaire is fixed and only for first time entry. If doctor requires, able to do the questionnaire part again. Then the results will update to the database and directly sends the disease level to the patients via mail/ SMS. This application helps for doctors and as well as patients.

2.1.1 System Interfaces

The application will be implemented in the Android Studio with Java and it will use Android SDK. The database will also used in the system to retrieve the data.

2.1.2 User Interfaces

The UI should be easy to manipulate without additional training. The user should be able to interact with the system and able to understand the GUI very easy. The interfaces should use the best graphical environment suitable to android application, should be built with the classified layouts able to manage the application. All interfaces of the mobile application should be accessible from any interface.

2.1.3 Hardware Interfaces

The application is related to the hardware system that should be implement by the team. It gives input of the patient's image processing level and send it to server. Then it sends the disease level that calculated from the device. The only created device should be used to get the hardware input to the system.

The mobile application should be used in android phones and tablets to use the application for the project.

2.1.4 Software Interfaces

The mobile application should be used in the android OS and it should be higher than 4.1. It can produce the performance and graphical level better than normal android system. The platform uses in the Android Studio and React Native. The database should be able to use the Firebase or PouchDB or local databases to store the data that consist the input of hardware and application inputs.

2.1.5 Communication Interfaces

The system requires to communicate with the server via HTTP. The application can be configured to be accessed with any available port. API uses to send and describes the messages that a program can accept the messages.

2.1.6 Memory Constraints

- Doc-Detector is expected to use 50-100 Mb of external storage and RAM.

2.1.7 Operations

- The mobile application should be connected via internet.
- Admin admits the doctor to the system for logins.
- The doctor admits patients to the system and the application verifies the user by Mail or SMS.
- All questionnaire conducts by the patients with the help of doctor.
- The data should be saved when it enters to the application. If connection lost, it automatically saves the data when it attends last.

2.1.8 Site Adaptation Requirements

The mobile application will be available for Android 4.0 or higher. Users should install the application from Google Play Store or custom application has with the Admin/ Developer of the mobile application.

2.2 Product Functions

Login

In order to login system, there are two ways to login to the system. One is Doctor level, and another is Admin level. Admin registers doctors to the system. After that, doctor can login the system with the required fields. Doctor can view his/her details and patients' details.

Register

Doctor can register the patients in to the system. After the doctor's login, there will be a Register button. After filling required fields with information of the patient, could be use the system with patients.

Logout

After login, user can logout the system any time. After logged out from the system, user will be redirected to the system. In the login page of doctor, can view the patient's logins with their permission(password/OTP). After login, doctor can logout and redirected to the patients list page.

Add Doctor

This button is required in the Admin's frame. Admin can use this button to enter the Doctor's details to the system and able to set the one-time password for first registration user. Then it automatically requests to change the password with new preferred password in the doctor's level interface.

Edit Profile

This function is on two interfaces in the system such as doctor and admin interfaces. This function is capable to edit only the personal details of the patient and doctor.

Update

The Update function will be used in the patient's profile to update the disease level of the Anemia through the hardware device. The disease level incudes the questionnaire marks and device.

Delete

In this function, can delete the doctor by Admin and delete the patient by Doctor. If doctor is deleted by Admin, the patients under the doctors will automatically delete in the system.

2.3 User Characteristics

The doctor who has a general knowledge about using Android device to operate the application with his requirements.

2.4 Constraints

Doc-Detector shall operate on Android version 4.0 or higher operating system. There should be at least 50-75 MB of the space on the device. CPU speed or RAM is not concern for this system.

Java is the best and most supported language to implement the mobile application with Android Studio/ React Native to support ADK's. Information of the users shall be encrypted before transferred to the database to maintain security of the information about users.

2.5 Assumptions and Dependencies

User interfaces and some of the functionalities may change during the implementation of the "Doc-Detector" mobile application and new features may be added which can change the functionalities and other related requirements. The available features and new functionalities will implement in the application.

2.6 Apportioning of Requirements

The basic functions Register, Login, Add Doctor, update etc. should be implemented in the beginning of the mobile application construction of the system. Other features don't have implementation order to construct the application. Mobile applications will be changed in the middle stage of construction.

3. Specific Requirements

3.1 External Interfaces

The User interface produced by the system are below.

Welcome Page

After installing Doc-Detector, and running the application first time can able to see the first page with two buttons such as Doctor and Admin. After clicking any button, user will be redirected to the login page.

Login Page

After clicking Doctor or Admin button, it will be redirected to the login page with Username and Password. The doctor's login page has a forgot your password option in the page. It is for who could not remember the password to login to Doc-Detector.

Patients Info Page

It is below to the doctor's login page. After login with the doctor's login, it will be redirected to the system. It shows that doctor's patients available in the system. In this page, there is a Add_Patient button to register the patients to the below doctor's system and Delete_Patient to delete the selected patient.

Patient Register Page

Doctors who can register the Patients in to the system. After filling all required fields, should click the Register button in the bottom of the fields to register the patient. Then it will be redirected to Patients Info Page.

Patient Login Page

It requires username and password that doctor registers the patient to the system. After filling required details, click login to go to the Personal Details page of Patient.

Patient Personal Details

It describes the patient's details and able to add the information with the help of patients. There is a button called "Questionnaire" to go to the questions page for patients to fill the information about the disease.

Questionnaire Page

It includes the questions related to the disease level and able to click the Options to the all questions. After finishing the questionnaire, it will be redirected to the Results Page.

Results Page

It displays the results of Questionnaire and the device image processing level of the disease. After that, it displays the total disease level of the patient. It has Update button to update only the device results in the application.

Doctor Register Page

Admin who can register the Doctors in to the system. There is Add_Doctor button to register the doctors. After clicking the button, there are few required fields to fill by the Admin with the help of Doctors. After filling required fields, click the Register button to submit the details. Then it will be redirected to the Doctors Info page in the Admin page.

Doctors Info Page

It has all details regarding about the doctors who has registered with the system. Admin can view the details of the Doctors and able to edit the details with the Edit button in the Page. This page has Add_Doctor, Edit_Doctor and Delete_Doctor buttons to add, edit and delete the doctors.

Shutdown Page

It must be developed in the future with requirements. It has a Turn off button to switch off the device with the help of mobile application.

3.2 Functions

- Login - Admin

Use case Number	1
Use case	Admin Login
Summary	Admin can login to the application
Actor	Admin
Trigger	Login Button
Primary Scenario	In this login, Admin can login to the system and able to view the doctor's details and alternate the details of doctors
Pre-conditions	None
Assumptions	Admin/User must be connected to the internet

- Login – Doctor

Use case Number	2
Use case	Doctor Login
Summary	Doctor can login to the application
Actor	Doctor
Trigger	Login Button
Primary Scenario	In this login, doctor can login to the system and view and alter the details of patients. He/ She can create an account for the patient in the system.
Pre-conditions	Doctor needs to register in the system
Assumptions	Doctor must be connected to the internet

- Add Doctor

Use case Number	3
Use case	Add Doctor
Summary	Add the details of the doctor
Actor	Admin
Trigger	Add Doctor Button
Primary Scenario	In this button, Admin can enter the doctor with required fields in the system. After that, doctor can login to the system
Pre-conditions	Admin must be logged in to the system
Assumptions	None

- Edit Doctor

Use case Number	4
Use case	Edit Doctor
Summary	Edit the doctor details
Actor	Admin
Trigger	Edit
Primary Scenario	Admin can edit the doctor details and save it to the system
Pre-conditions	Doctor must be added to the system
Assumptions	Doctor must be in the list to edit doctor

- Delete Doctor

Use case Number	5
Use case	Delete Doctor
Summary	Delete the doctor in the list
Actor	Admin
Trigger	Delete Doctor
Primary Scenario	Admin can delete the doctor in the list he/she requested
Pre-conditions	Doctor must be added to the system
Assumptions	Doctor must be in the list to delete

- Login – Patient

Use case Number	6
Use case	Patient Login
Summary	Login to the system for add the disease details
Actor	Patient
Trigger	Login Button
Primary Scenario	Login to the system for attend the questionnaire and view the results of questionnaire mark and device results of the patient
Pre-conditions	Patient must be registered to the system by doctor
Assumptions	None

- Add Patient

Use case Number	7
Use case	Add Patient
Summary	Add the patient details to the system
Actor	Doctor
Trigger	Add Patient Button
Primary Scenario	This function can add the patient to the patients list. Doctor needs to fill the required details and register the patient

Pre-conditions	Doctor must be logged in to the system
Assumptions	None

- Delete Patient

Use case Number	8
Use case	Delete Patient
Summary	Delete the patient in the system
Actor	Doctor
Trigger	Delete Patient Button
Primary Scenario	Delete the patient in the list by a doctor who handled him/her
Pre-conditions	Patient must be already added in the system
Assumptions	Patient must be in the system

- Update

Use case Number	9
Use case	Update
Summary	Update the device measuring level
Actor	Doctor
Trigger	Update Button
Primary Scenario	The device will be measured the first time by the patient. Then after that, if the patient requires to get the measuring level once again, need to measure and update the level to the system. It automatically reflects the total level of the system
Pre-conditions	Patient must finish the questionnaire
Assumptions	Doctor must be logged the patient

- Logout

Use case Number	10
Use case	Logout
Summary	Logout from the system
Actor/s	Patient, Doctor
Trigger	Logout
Primary Scenario	The function helps to logout from the system for doctor and patient
Pre-conditions	Doctor/ patient must be logged in to the system
Assumptions	Actors have already logged in to the system

- Shutdown

Use case Number	11
Use case	Shutdown
Summary	Shut down the device
Actor	Doctor
Trigger	Shutdown Button
Primary Scenario	This function is going to shut down the measuring device by the mobile application. It helps to turn off the device without hard use
Pre-conditions	Doctor must be logged in to the system
Assumptions	Device must be turned on

3.3 Performance Requirements

- There will be large amount of information is going to handled by the database such patient, doctor details and questionnaire and the measuring level and the sever and database will be enough space to handle the activities.
- All the functions should be performed less than 10 seconds.
- The application should be automatically logged out when there is no response from the user.
- Doc-Detector will be able to support only one User at simultaneous time. The capacity will be extended in the future.

3.4 Logical Database Requirements

- In the database will be stored integer, varchar and string datatypes.
- The stored information will be used in the Doctor, patient details, available date system, etc.

3.5 Design Constraints

- There are no special design constraints in this mobile application.

3.6 Software System Attributes

3.6.1 Reliability

The system should keep the database information consistently. It works very accurate and the mobile application will run on any other android based phones and tablets.

3.6.2 Availability

The application will be available for 07 days and 24 hours(24x7) if internet connection is available to the android device.

3.6.3 Security

It has proper programming techniques and require of username and password for all users of the using the application. Stored data should not be reached by other applications that is installed in the user's device. The data is encrypted when will be reached before the database.

3.6.4 Maintainability

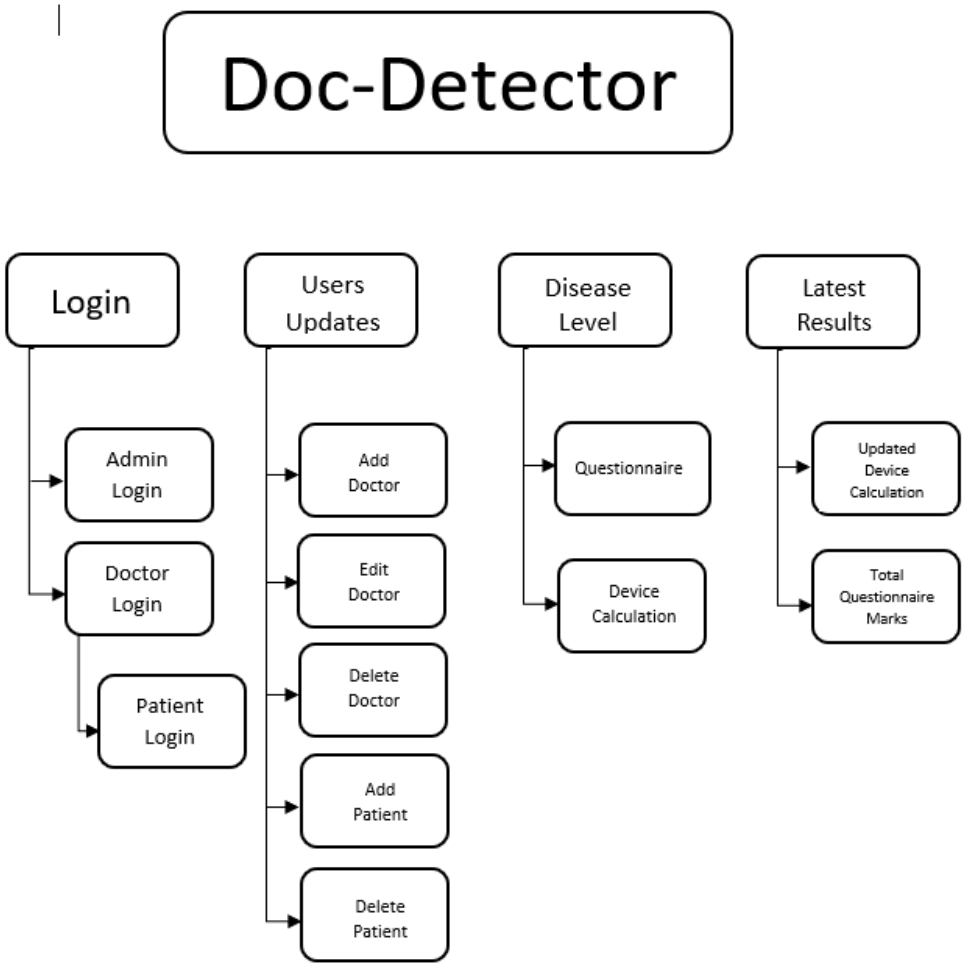
All programming codes are should be easy to read, understand. Program tasks are independent of each other and it is easier to maintain. The application can be maintained by the admin when there are any issues in the database or access level.

3.6.5 Portability

Application is only work on Android OS. Therefore, mostly android phones and tablets use to run this application to do the activities.

3.7 Organizing the specific Requirements

3.7.1 Functional Hierarchy



4.0 References

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