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**Software Requirement Specifications**

**Development of smart teleclinic application**

Version: [1.0]

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| --- | --- |
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| Submission Date |  |

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***Document History***

[Revision history will be maintained to keep a track of changes done by anyone in the document.]

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| **Version** | **Name of Person** | **Date** | **Description of change** |
|  |  |  | [e.g. Document Created] |
|  |  |  | [Added Non-functional requirements] |
|  |  |  | [Added UseCase x.x.xx] |
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# Introduction

## **1.1. Purpose**

The purpose of developing a smart teleclinic application is to provide the facility to be treated well regardless of the locations and situations.

This document presents a detailed description of smart teleclinic application that we are intended to develop. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external factors.

This Document present an overall and detailed view of the system and its specifications and objectives.

## **1.2. Intended audience**

This document is intended for the audience including the developers and project managers. This document is also for technical and non-technical users. This document contains detail of product and its functionalities that will be sufficient and easily understandable for both technical and non-technical users.

## **1.3. Document convention**

|  |  |  |
| --- | --- | --- |
| 1 | Fonts | Times New Roman |
| 2 | Size | 16 for the Main Headings, Bold |
| 3 | Size | 14 for the Sub Headings, Bold |
| 4 | Size | 12 for the rest of the Document |

# 2.0. Overall system description

## **2.1. project background**

**However, the use of digital technology in health care delivery has the**

**potential to provide a needed breakthrough in achieving access to high-quality care to everyone no**

**matter where they live**

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**potential to provide a needed breakthrough in achieving access to high-quality care to everyone no**

**matter where they live**

Health is an important factor of human life. With sound health everything is just glorious. But with passing time obtaining good health is getting tough day by day. A common people is not able to have the optimal clinics and availability of doctors at their regions for which they face difficulties to be treated well on time.

Specially, routine checkups are hard to handle and out of budget now a days as it takes a lot of resources which are not affordable by the majority of people. Besides this, getting a good and highly qualified doctor is quite tough in these busy schedules because for that we have to wait in long queues for the turn to the.

The project team is highly focused for providing a platform that addresses the solutions to the way to consult a doctor. The team is quite determinant to provide the platform which eliminates the need to visit the doctor physically.

However, digital technology in health care delivery has the potential to provide a needed breakthrough in achieving access to high quality care to everyone no matter where thy live.

Also studies have shown that teleclinic promotes continuity of care, decreases the cost of care, and improves patient self-management and overall clinical outcomes.

The project team aims to have the

## **2.2 Project scope**

The scope of "Smart Teleclinic" involves the implementation and development of a mobile application that enables patients to consult doctors in real time while remaining in their familiar surroundings.

Both patients and doctors will be able to use this sophisticated teleclinic technology. By offering an online platform, this system will be created to increase the odds of obtaining good health while spending less resources. To save time waste, this method would also let users physically make appointments online.

More specifically, both patients and doctors will benefit from this approach. It can be hectic for doctors to see patients in person because they must devote a lot of time to each one while also waiting in large lines. Each patient who receives care online will log in at the time of his scheduled visit. In order to handle a case immediately if it requires physical treatment, this system will also offer the option of scheduling a doctor visit.

Patients can contact the doctor via a chat box service and have access to their own medical records.

## **2.3 Not in scope**

Through this platform, treatments that can be cured only via physical visit cannot be entertained through this platform. Also physical bookings are taken to the interior Sindh only excluding Hyderabad and areas after it.

## **2.4 Project objectives**

Our goal is to create an application that links patients and doctors.

The fundamental goal of teleclinics is to digitalize clinical visits so that patients can receive effective care in the comfort of their own homes without having to confront the difficulties associated with traditional clinic visits. This platform aims to make full use of technology in the medical profession so that patients can profit from it and receive prescriptions through the same channels they use in daily life that is, their mobile phones and internet access. We want to accomplish this with complete flexibility so that people won't feel burdened by clinical appointments and may receive treatment conveniently at home. By properly implementing this system, we will be able to do away with the necessity for long wait times at clinics, distance travel for routine examinations, and maintaining extensive prescription histories. The capacity to treat patients remotely frees doctors from having to personally visit every patient.

Telemedicine decreases the requirement for actual physical space as well as the necessity for staff and other expensive healthcare expenses. Consequently, the technique improves the bottom line.

## **2.5 Stakeholders**

There are mainly two stakeholders of this system. This system will surely suit Doctors in multiple ways and the patients who want to be treated well from comfort zones.

## **2.6 Operating environment**

The Operating environment in which app will operate including android and for hardware platform we need android mobile with minimum 6.0 Marshmallow and onwards version. There must be internet connectivity to the Doctor and patients end as there will be online consultation.

## ***2.7* System Constraints**

* This system is mainly for online consultation so there must have a good internet connectivity to the mobile phone and more properly there should also have microphones for video/audio consultation.

## **2.8 Dependencies and assumptions**

* Android mobile phone with minimum marshmallow 6.0 and onward versions.

# 3.0 External Interface Requirements

## **3.1** **Hardware Interfaces**

The hardware interfaces required to run this app any Android Mobile phone with version Android Marshmallow 6.0 and onward versions.

## **3.2 Software Interfaces**

Software interfaces required for developing this system are as follows

**Integrated development environment.**

We will be using the Android studio for the development.

**Languages used**

Kotlin is the main language used for the system development, besides this React will also be used frequently to develop the interface of the system.

**Database**

We will use firebase realtime database for keeping the record of patients visits.

**Video calling**

For vidoe calling service we will use google APIS like JETSI or AGORA to have the real time video consultation of patient.

**Payment**

For payment purpose we are intended to use E-wallets and jazzcash.

## **3.3 Communiction interface**

The system will be based on three tier architecture.

# 4.0 Functional requirements

The application has two profiles

- The Patient profile which will be used to take online consultation.

- The Doctor profile which will be used to give online consultation services.

The patient and doctor are bound to have an android device with Smart Teleclinic application installed in it.

The Application has following functions,

1. Create a profile

2. Confirm Verification

3. Online consultation

4. Chat-box

5. Book appointments

6. Send payment

## 

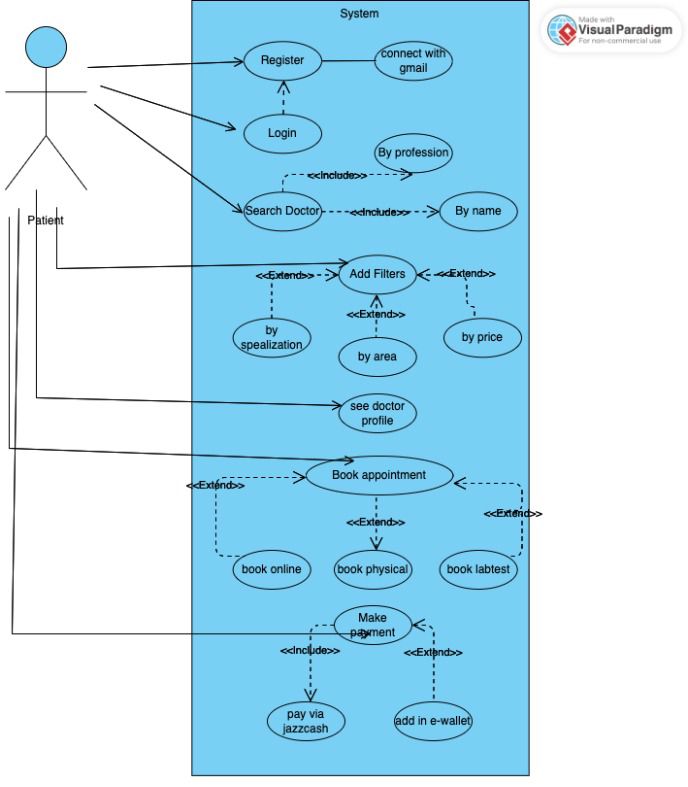
## **4.1 Functional Hierarchy**

* Authenticate
  + When user opens the app, the user should register or log in.
* Search for doctor
  + If the user/patient is successfully logged in he/she will search for doctor according to the disease.
* Add filters
  + During searching of a doctor patient can add filters to find doctor accordingly. Patient can add filter according to area, price of a doctor and specialization of a doctor.
* Book appointment
  + If Patient has successfully searched the respected doctor then will book the appointment. Appointment can be physical, online or it can be for lab tests.
* Make Payments
  + After appointment user can make payments.
* Cancel/Update Appointment
  + If patient has another emergency or any other issue and wants to cancel or update the appointment, he can do that as well.
* Confirm Appointment
  + Patient should confirm the appointment.
* Generate receipt

After the confirmation of appointment system will generate the receipt.

* Video consultations
  + If the patient is willing to have the video consultation he can request to do so.
* Audio consultation
  + Patients can also have consultation by audio call.
* Free chat
  + Patient can request doctor for prescribing more if he faces any issue in between.
* Patients view their records
  + Patient can view his/her records of prescriptions and appointments.
* View and Print Ticket Receipts
  + When payment is done patients can view and print fees receipts from the records.
* Doctor views the records
  + By the end of consultation doctor can view the history including the payments, patients list.

# Use cases

******

***Diagram

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***Authenticate***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Authenticate>*** | | | | |
| ***Use case Id:*** | | UseCase01 | | |
| ***Actors:***  *User* | | | | |
| ***Feature:*** It is used to authenticate user. | | | | |
| ***Pre-condition:*** | | User must be registered in the application | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | User opens the application | | | App allows user to enter their username and password. |
| ***2.*** | User enters their username and password to enter to the system. | | | Application verifies the credentials of the user and allows the authenticated users |
| ***3.*** | User is redirected to the home screen of the application. | | |  |
| ***Alternate Scenarios:*** | | | | |
| ***1a:*** If user enters an incorrect username and password then system will generate the error message and user is not allowed to log in.  2a: If the user has forgotten their password, they can click on the "forgot password" link, which prompts them to enter their registered email address. The app then sends a password reset link to the email address**.** | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | After the login user must perform other actions. | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase02 | |

***Search Doctor***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Search for Doctor>*** | | | | |
| ***Use case Id:*** | | UseCase02 | | |
| ***Actors:***  *Patient* | | | | |
| ***Feature:*** It is used to search for a doctor | | | | |
| ***Pre-condition:*** | | Patient must have logged in to the application | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patient search for a doctor using filters including location, price, timing, and specializations of a doctor. | | | The app shows all the available doctors based on the search of a patient. |
| ***2.*** | Patient selects a doctor and clicks on his/her profile. | | | The App will take user to the next page where the details of the doctor are present. |
| ***3.*** |  | | |  |
| ***Alternate Scenarios:***  *1a*: If there are no availability of a doctor in a specific location then app will show a message to patient indicating that there is no availability of the doctor. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | After searching the doctor, patient can view the list and profiles of doctors | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase03 | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Booking of appointment>*** | | | | |
| ***Use case Id:*** | | UseCase03 | | |
| ***Actors:***  *Patient* | | | | |
| ***Feature:*** It is used to book the doctor appointment. | | | | |
| ***Pre-condition:*** | | *Patient have selected the respected doctor on the “search doctor” page.* | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patients navigates to the book doctor appointment page. | | | The page loads and display the form for patient to fill in. |
| ***2.*** | Patient selects the type of appointment he wants to book. | | | The page displays the appointment types like physical, online and appointment for lab tests. |
| ***3.*** | Patient enters the details including name phone number and the appointment type. | | | The form is filled with the patient’s given input. |
| ***4.*** | Patient clicks the “book appointment” button. | | | A dialog box appears, displaying the details of the appointment such as appointment timing, charges. |
| ***5.*** | Patient confirms the appointment. | | | The appointment is confirmed and patient is redirected to the confirmation page. |
| ***Alternate Scenarios:*** | | | | |
| 1a: If the patient cancels the booking, the dialog box closes and the patient remains on the appointment booking page.  ***3a:*** If user has not confirmed the appointment and navigates to the other page then still appointment is not confirmed and user has to do the process of booking again. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | Doctor’s slots are reserved for the specified time and appointment cannot be booked. | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase04 | |

***Book appointment***

***Make payment***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Make payment >*** | | | | |
| ***Use case Id:*** | | UseCase04 | | |
| ***Actors:***  *Patient* | | | | |
| ***Feature:*** It is used to make the payment. | | | | |
| ***Pre-condition:*** | | Patient is logged in to the application and has jazz cash account. | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patient navigates to the make payment’s page. | | | The page loads and display the payment options. |
| ***2.*** | Patient selects the payment option. | | | The page displays the options for payment such as jazz cash or E-wallet. |
| ***3.*** | Patient enters the account details for the payment | | |  |
| ***4.*** | Patient clicks the “confirm payment” button. | | | The dialog box appears displaying the details of the payment including the amount paid and timing. |
| ***Alternate Scenarios:*** | | | | |
| ***1a:*** Patient navigates to the other page without confirming the payment then booking can not be confirmed. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | Patient has not required amount in his/her account and make no payment. | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase05 | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Consultation of doctor via audio or video call >*** | | | | |
| ***Use case Id:*** | | UseCase05 | | |
| ***Actors:*** Patient | | | | |
| ***Feature:*** It is used to consult a doctor according to the specified appointment | | | | |
| ***Pre-condition:*** | | Patient must have good internet connectivity and microphones connected to the mobile phone. | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patient navigates to the consultation page. | | | The page loads and displays the consultation details. |
| ***2.*** | Patient selects the consultation type from the give options. | | | The page displays the consultation options such as audio or video call. |
| ***3.*** | Patient clicks the consultation type. | | | Page loads and asks for the permission to allow camera and microphones respectively. |
| ***4.*** | Consultation starts. | | |  |
| ***Alternate Scenarios:*** | | | | |
| 1a: Doctor can end the consultation call keeping in view the privacy premises.  2a: If the internet connectivity is weak at patient’s or doctor’s end consultation ends there.  3a: If patient is not available on the specified time booked by him/her, doctor will wait up to 5-10 minutes otherwise his consultation will be cancelled without refunding the amount. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase06 | |

**Consult doctor**

***Free Chat***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: After consultation chat with doctor>*** | | | | |
| ***Use case Id:*** | | UseCase06 | | |
| ***Actors:***  *User* | | | | |
| ***Feature:*** It is used to do free chat with doctor after consultation if he has any issue. | | | | |
| ***Pre-condition:*** | | Patient must have consulted to doctor before and has previous record of consultation. | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patient navigates to the free chat box page. | | | App displays the free chat box service. |
| ***2.*** | Patient sends request to the doctor for doing chat. | | | App will send patient’s request notification to the doctor. |
| ***3.*** | Doctor accepts or he can reject the Patient request for chat. | | | *Notification of acceptance or rejection will be sent to the patient’s end.* |
| ***4.*** | Patient and doctor starts chatting. | | |  |
| ***Alternate Scenarios:*** | | | | |
| ***1a*:** If patient has weak internet connectivity, then chat box closes and chat ends there. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | Chat is done successfully and patient’s query is solved. | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | Usecase7 | |

***View history***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id: Patients view the record>*** | | | | |
| ***Use case Id:*** | | UseCase08 | | |
| ***Actors:*** Patient | | | | |
| ***Feature:*** It is used to allow patient to view his records or history. | | | | |
| ***Pre-condition:*** | | *Patient is logged in to the application and he has consulted to the doctor before.* | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Patient navigates to the records page. | | | App displays the options for viewing the records |
| ***2.*** | Patient selects the option such as prescription record, appointment record and payment receipt to view. | | | App moves to the specified option selected by the patient and display all the records of patient. |
| ***3.*** |  | | |  |
| ***4.*** |  | | |  |
| ***Alternate Scenarios:*** | | | | |
|  | | | | |
| 1a: Patient has not visited any doctor then he has no records to visit. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | *Patient successfully viewed the records and activities taken by him.* | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | | usecase09 | |

***View History***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***<Use case Id Doctor can view records >*** | | | | |
| ***Use case Id:*** | | UseCase09 | | |
| ***Actors:***  *Doctor* | | | | |
| ***Feature:*** It is used to view the records or history of patients. | | | | |
| ***Pre-condition:*** | | *Doctor is logged into the application.* | | |
| ***Scenarios*** | | | | |
| ***Step#*** | ***Action*** | | | ***Software Reaction*** |
| ***1.*** | Doctor navigates to the records page. | | | Application displays the options in the doctor’s profile. |
| ***2.*** | Doctor can view the records of patients, their prescriptions, upcoming appointments, and payments. | | | Application displays all the respected information of the patient to doctor. |
| ***3.*** |  | | |  |
| ***Alternate Scenarios:*** | | | | |
| 1a: Doctor has not consulted any patient before so he has no record of patient to view. | | | | |
| ***Post Conditions*** | | | | |
| ***Step#*** | ***Description*** | | | |
| ***1*** | *Doctor can successfully view all the records of patients and payments.*  *Doctor can verify his/her payments.* | | | |
|  |  | | | |
| ***Use Case Cross referenced*** | | |  | |

# 5.0 Non-functional requirements

- Android application will be developed in Android Studio.

- GUI of the system should be clear and easy to use.

Following are the non-functional requirements that are encountered, and we will encounter some more that we will add time by time

## **5.1 Usability**

This application will be only access via play store so only Android users will be able to use the application.

1. The user interface must be GUI based.

2. The users are required to input the data from cell phone keypad

3. The User Interface consists of J2ME GUI components like Forms, Buttons, Canvas, Textbox, Text Field, Alert Boxes and Lists.

5. The user can create its favorite lists of people.

6. The user can save its amount in the e-wallet sections and use it while booking the appointment.

7. Enable the dictionary words

## **5.1. Performance Requirements**

The application should respond to users quickly. The interface should be friendly and easy to use.

## **5.2. Safety Requirements**

The application should detect the unexpectable words by patient during the chat with doctor.

## **5.3. Security Requirements**

The application should make transactions securely and keep user credentials secure.

## **5.4. User Documentation**

The user manual will be available for help. The user manual should be provided in which clear instructions should be given.

# References

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6801564/>

https://www.researchgate.net/publication/331136831\_Digital\_Technology\_and\_The\_Future\_of\_Health\_Systems