POLITECNICO DI MILANO

Master's Degree in Automation and Control Engineering

PROJECT DOCUMENTATION

"MediAssist"

For Software Engineering

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2018/2019

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ABBREVATION

API	Application Program Interface
DB	DATBASE
RASD	Requirement Analysis and Specification Document
TP	Test Procedure

CHAPTER 1

1.1 FEASIBILITY ANALYSIS:

The General Notion of our project is to find the nearby doctors and pharmacies based on the user's location. Here we are conducting a feasibility analysis of our idea and to check how feasible the application is for the user. As a result, here we are presenting our application to avoid manual searching and to ease the reliability and has many other advantages which will be shown in the upcoming sections.

1.1.1PROJECT DESCRIPTION:

The main aim of our project is to find nearby doctors and pharmacies based on the user location and to help the people who are in a new place and to understand the medical procedures in the respective countries if they are travelling abroad. This application has a potential ability mainly for the people who are travelling often and people who are moving to a new place within the country and outside the country, this will help he/she to find they're nearby based on his/her location or assistances of their choice such as doctors and pharmacies. This application helps to avoid manual searching (such as lengthy typing in search engines) which will be difficult at times of emergency to find their suitable doctors. It also helps them to reduce their time and energy by using this application in panic situations. This application also helps the user to find their nearby doctors, pharmacies opening timings which will help the user to plan their timings of when to visit the doctor based on his daily available time and the application is interfaced with google maps which helps the user to know the all possible modes of transport to the assistance location. In our view, we believe that this application has a very good future and will benefit the person who is using it. Being a foreigner ourselves and our friends like us. We all personally faced this problem. Language is the main barrier for us to understand the medical procedure in the country. So we thought to have a mobile application which can help people to deal with this kind of problem and make anyone feel at home.

1.1.2 POSSIBLE SOLUTION:

In today's Information Technological era everyone is relying on a mobile device and connected with the world wide web so that developing a mobile application will be a highly feasible solution. To make the mobile application for both android and iOS

which are the OS for most of the smartphone used. We had chosen the Expo platform because it is ideal for both iOS and Android platforms. For example, we can write the code in JavaScript initially and once the application is developed, we can generate the android application package and the iOS app storage package. This will reduce the cost and time for developing the application for an enterprise. This saves a lot of time developing the apps and makes maintenance of your apps cheaper and leaner because you don't have to do the same job twice. Because of the above-said merits expo platform has become our prime choice for the development of our application "Medi Assist".

1.1.3 EVALUATION CRITERIA:

We also evaluated our application by using a suitable testing method whether it satisfied our required specification or not. At present we have developed the application to find the nearby doctors and pharmacies based on user location and the application has satisfied our work which we intended to do before. We also evaluated the application and it runs according to what we expected. We also conducted a post-survey after the development, from the common people and we got a very good positive response and feedback for the development of the application. We had done this evaluation for the improvement and need for the modification and ultimately to lay the foundation for future development.

1.1.4 FEASIBLE SOLUTION:

A digitalized and user-friendly application will be the most feasible solution to solve this problem. The user finds this application more feasible because it helps him to identify the nearby doctors and pharmacies and he/she can have a view of the available doctors and pharmacies based on the user location and can himself select the doctor's clinic/pharmacies which takes them directly to the maps where can he/she can find a way of how to reach the doctor's clinic, pharmacy. So we found this application will be very feasible for the people who can save their time at most.

1.1.4 CONCLUSION:

In our point of view, we believe that this application will very handy to use and can help the people to reach the doctor's place at the earliest convenience. Nearly 70% of respondents said that they were pleased to use the application, and this would reduce their time and effort of finding the suitable doctor and pharmacies available nearby. Despite the fall in the 1st quarter of 2017, the medical industries still present

a 224-Billion-dollar market in Europe and a 7.7 trillion-dollar market worldwide. Also, we are from the Automation and Control Background, and so we would like to know how to build an application user interface which will help us to build our own app for what we need in the future.

1.2MARKET RESEARCH ANALYSIS:

Market Analysis is one of the crucial components of any application development and business with all required information and making a wise business decision. This effective market analysis has helped us in getting valuable insights into shifts in the economy, competitors, ongoing market trends. Our vision is to give a new and innovative option in the field of medicine.

1.2.1 EXECUTIVE SUMMARY:

Behind every successful product present in the market today, there is a story of substantial market analysis of the application, competitors, and customers. In our analysis, most of the travelling people(tourists) and students are facing the difficulties of understanding the medical policies in the country in case if they are travelling abroad and most end up in difficulties mainly to find the nearby suitable doctors and pharmacies. As being the students of Politecnico Di Milano we also at times faced the problems of finding the nearby suitable doctor and pharmacies and understanding the medical policies of the country. Based on our idea we had conducted a survey among the common people, and the results of the survey were in a positive manner as we excepted that most of them finding the same difficulties as we faced. Most of the surveyors were students. Based on our market research, the result which we got if the application is implemented, we will have customers to buy it. The main purpose required from the needs of the people was, the application must be simple and user-friendly, and it must help all the common people to find their requirements in ease. The main reason for our research work is to identify the need of the people in medical and to compare our thoughts and to validate them. In a nutshell, the survey helped us to find the appropriate solution in ease i.e. the development of mobile application “MediAssist”. We concluded that a user-friendly mobile application can help in solving the problem above narrated and it will also create a market that will lead the enterprises to generate profit.

1.2.2 DATA COLLECTION:

Data Collection is done through google forms and several questionnaires were mentioned and the survey was taken by forwarding our list of questions in Google forms to our family and friends from the university. We had a survey of one hundred people through google forms and several results were got through them. Here are the following survey questionnaires and the results which we got through them are graphed below,

- Type of Profession of the person?
- Type of Mobile OS?
- How likely will you be travelling?
- Are you staying away from home?
- How often will you encounter the difficulties of medical assistance when travelling to a new place?
- What kind of difficulties will be in major during the medical situation?
- Imagine that you are under medical emergency when you're travelling or away from home, how helpful will it be if you have a mobile application?

We collected the survey results from students and common people in the university. Based on their feedback we concluded on how to carry out the design and working of the application.

From the response to the first question, we generated a pie chart and in that one can see that the maximum number of people falls under the student's category.

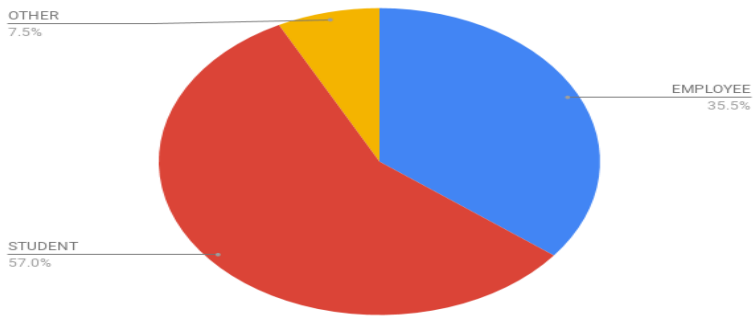

Figure 1 Type of Profession

From the response to the second question in which we concluded that major smartphones OS are Android and iOS. This can be evident in figure 2.

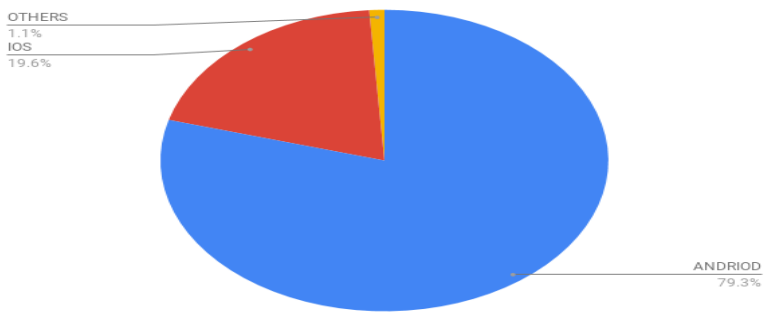

Figure 2 Type of Mobile OS

From the response to the third question, it is evident that on average 3.40 on a scale of 5 which is nearly 68% of people will be travelling often and this result supports one step further for the idea. The responses can be seen from the figure below,

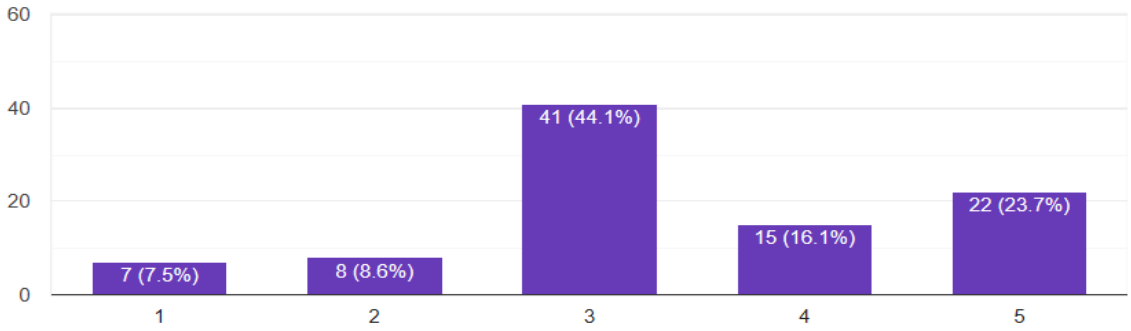

Figure 3 Percentage of Travelling Often

For the fourth question, we have shown the results in the form of a pie chart and the maximum number of people are staying away from home.

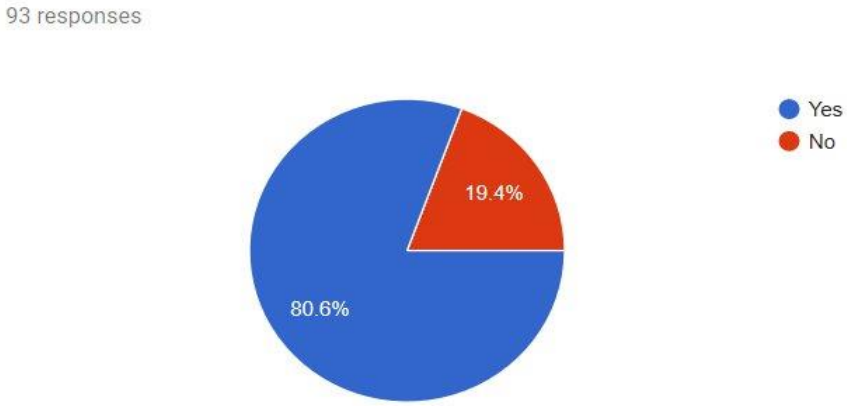

Figure 4 Away from Home

For the fifth question, we asked the surveyor does he/she had encountered any difficulties for medical assistance when travelling to a new place. Since most of the surveyors were fall under the student's category which will have an age category under 35. Overall people who are under this age category will be healthy in general and won't need assistance often. The results of this response indicate this statement. To sum up the results nearly 53.6% (2.67% on average) have encountered the difficulties for medical assistance when travelling to a new place.

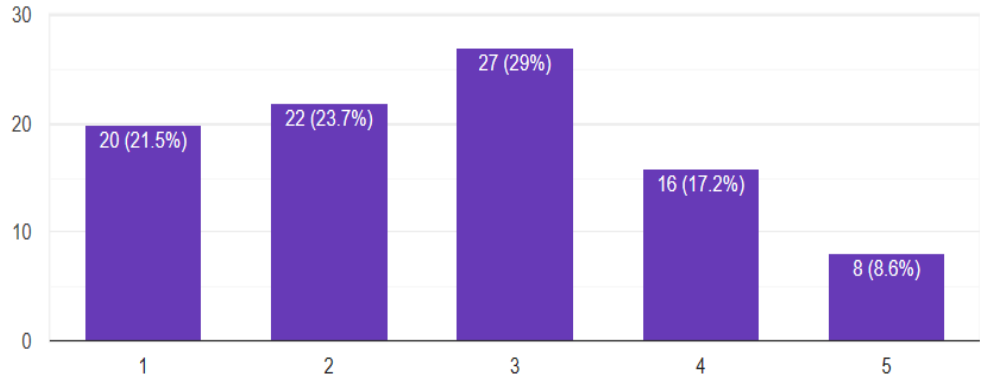

Figure 5 Difficulties to Find Medical Assistance

In the sixth question, we have shown the results in the form of a bar chart more than 50% have a problem in finding language, finding the location and understanding the medical policies in a country.

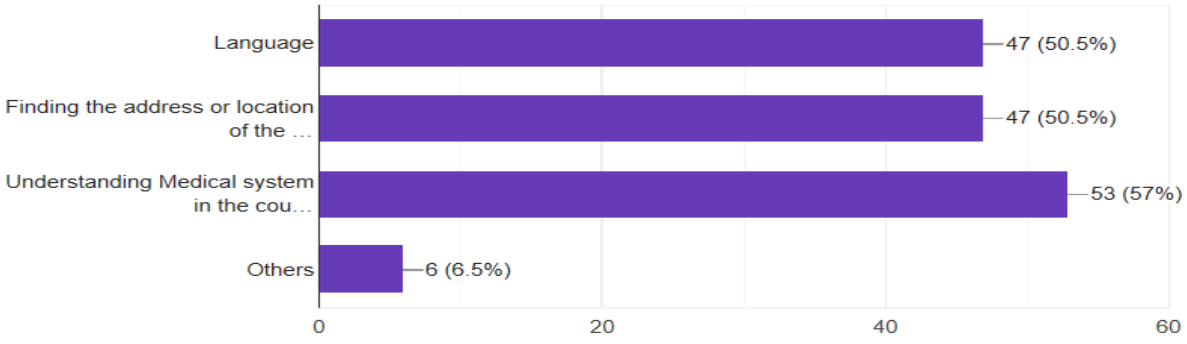

Figure 6 Kind of Difficulties

In the fourth question, we got the output as nearly 53% of the people only have faced the problem of Medical Assistance in a new country. So in this seventh question we gave an imaginary situation, that the surveyors are travelling during the travel we asked them to imagine that they are under a medical emergency and we asked how

helpful will be a mobile application to them during that time and we got the output that more than 80% of people require an application which will be helpful for them.

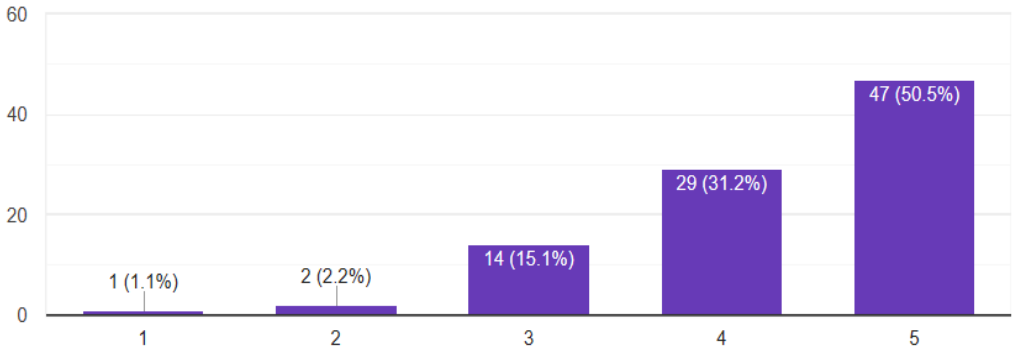

Figure 7 Imaginary of Medical Emergency When Travelling

So, everyone has a fear that they will get into a medical situation and during the time even the simplest google search will seem to be a hectic process. This fundamental response is our foundation to develop a user-friendly application that can help during this time.

1.2.2.1 ETHICAL CONSIDERATION

Ethical Consideration is one of the important aspects of Market research. A few of the Ethical Considerations that were considered by us while taking the survey were data security, privacy, and confidentiality of the research participants. We were more concerned about it and we asked only their name, Country of living and Profession and we didn't ask their email id, contact number because those are their private data. Also, we included only their name because to avoid multiple responses.

1.2.3 PROBLEM DEFINITION:

Based on our data collection, we identified the problems faced by the people by drawing the comparison of the problem of our vision and people's vision.

1.2.4 TARGET GROUP:

Our target groups were the travelling people, Students, Working people and the general people. In the nutshell, all the people will require this application and it will be helpful for them.

1.2.5 APPROACH TO THE PROBLEM:

Our main approach to the problem was to make a very simple mobile application which can be very handy and useful for all the common people's usage. We are following 80/20 rule by means of it around 80% percent of World Population is having Smart Phones.

1.3COMPETITOR ANALYSIS:

Few Start-up Companies have developed the application in various manner targeting the problem of finding the doctors in a country. We took those applications as our reference models and we tried to overcome the problems which were not properly done by those applications. Our direct competitors are Doctor Finder, Practo. The main drawback of Doctor Finder is

- Inbuilt User Interface Problems.
- Less Flexibility.
- Limitations of Doctor and Pharmacies.
- No GPS was not integrated with this application.
- No proper maintenance and not in proper working condition.

The Main drawback of Practo Application are

- In this application, the doctors are given ratings and they are divided into several categories like Prime Doctors and it is like an advertisement.
- The people are getting manipulated to go for the prime doctors because the doctors are paying money to the application for their better promotions to show them as the prime doctor. This was the major complaint received in the feedbacks of this application because their service was not so appropriate.

CHAPTER 2

2.1. INTRODUCTION:

2.1.1 Purpose:

In this chapter "Requirement Analysis and Specification Document," we provided all the detailed aspects of our working application "Mediassist", including its components, goals, constraints, functional and non-functional requirements. The main purpose of the document is to fulfil the user requirements and the detailed description of what the system must do. The requirement analysis is very critical to the development of an application and the requirements must be actionable, measurable, testable related to our business need in our case(searching for assistance in the application instead of searching through other websites) which should be defined to a level of detail and sufficient design.

The high-level functionalities described are intended for both developers and project managers. It is important that we developed the application satisfied all the user requirements. The formers must implement and test the functionalities while the latter must examine whether every requirement has been respected.

2.1.2 Problem Description:

The application described in RASD is the "Mediassist" mobile application which can find the nearby doctors and pharmacies based on user location. We developed this application mainly focused on "students, people who are relocating for work and people who are travelling".

The main aim of this application is to integrate the application with google maps and it has some constraints in it, in order to give the user a friendly environment for finding the way to reach the doctor's location. And, we addressed various problems through interviews and surveys for the better use of the application by the end-users.

2.1.3 Application Ideas:

- Having consistency and simple steps to enter the application by downloading it from the Play Store/App Store.
- Developing a simple graphical user so that the user has a consistent mood to use the application several times.

- We didn't include the login details initially because we need to get popularized.
- Displaying the list of available assistance in the google map and the available time of assistance per day according to the day of the search.
- Integrating the google maps with an application and helping the user to find the shortest route to reach the user location.

2.1.4 Target:

The main target of the work is to build an application that satisfies all the prerequisites and the requirements requested from the survey. an application that will satisfy all the user needs and the Doctor's needs who is a customer to the MediAssist enterprises. Sign in and Sign up activity are done by patients and doctors. The patients log in to find assistance and to book an appointment. The Doctors log in to view the total number of patients who booked the appointment with him/her and to modify or update his/her working timings an also doctor will update the number of people in line to the server, this details are used by MediAssist platform to predict the waiting hours in general, then this details are shared with the user who is searching for doctor assistance.

The User's targets in the application are,

- T1 – Country, City Selection.
- T2 – Assistance Selection.
- T3 – Load Map with a marker or icon
- T4 – Click on the marker or icons(user-defined)
- T5 – Display of the Assistance Content box
- T6 – Book Appointment
- T7 – Get Directions
- T8- Redirected to Google Maps

The Doctor's targets in the application are,

- DT1 – View the number of appointments booked
- DT2 – Modify/Update their timings in the application
- DT3 – Update queue number in the application

2.1.5 Special Purpose Targets:

The special-purpose targets are the ones that can be handled only by the admin who can be authenticated.

- ST1 – Database Access or handling
- ST2 – Send feedback message of booked appointment to the user

2.1.6 Constraints:

The only constraint in our app is the user can book five appointments per booking.

2.1.6.1Regulatory Policies:

- The database handling, doctors and pharmacies list can only be accessed by the admin.
- The application is subjected to copyrights.
- The application is also subjected to the law based on the local laws in the country.

2.1.6.2 Software Limitations:

- Internet or WIFI should be available.
- The location service should be switched on.
- Google maps should be installed.

2.2 REQUIREMENTS:

2.2.1 Functional Requirements:

The following are the basic functional requirements which have been decided according to the development of the application and the assumption mentioned are according to the goals.

T1 – App Download

The user should open the google play store or app store in order to download the application and to use it to access and use all the facilities provided by the application.

T2 - Language Selection:

For now, the app is available in the English language in later versions all the major languages will be included.

T3 – Sign in or Signup:

The next step which is required by the user to do is sign in or signup. The user needs to enter all his details like name, surname, email id, password in order to access the application which is mandatory. Once the user is successfully registered on the database, he/she can access the application and find their assistance in their convenient manner.

T4 – Country, City Selection:

Once the user is logged in, the home page will be displayed where he/she can select their country and city in order to find their assistance nearby of their current location.

T5 – Assistance Selection:

The user can select the assistance based on his/her requirement. Different types of Assistance are given like Cardiologist, Dentist, General Practitioner, and Pharmacy and the user can select his/her preference based on their requirements.

T6 – Load Map with Marker or icon:

Once the user has selected the particular assistance of his need, the user will be redirected to the map where he/she can find their selected assistance in the google map. The user can view all the assistance nearby of his/her location.

T7 – Click on the marker or icons (user-defined):

The map which is loaded is displayed with the overall selected assistance by the user on the home page. The user can find the nearby assistance in the map and make further proceedings the user clicks on the assistance icon.

T8 – Content Box Appears:

Once the user clicks the nearby assistance on the map, a new content box appears where the user can find two options, one option is for booking an appointment and one option for getting directions to reach the assistance location.

T9 – Book Appointment:

Once the user decides the assistance, he/she will find an option to book an appointment on the available timings of the doctor.

T10 – Click on get Directions:

Once the user decides and selects the assistance of which place to go he/she will find an option to get the direction button in the content box. We decided to link the google maps with the application in order to have a comfortable and suitable environment for the user to find the direction to reach the doctor.

T11 – Redirected to Google Maps:

Once the user clicks on getting direction icon, the direction will be redirected to the google maps.

The Doctor's requirement and their target achieved in the application are,

DT1 - Viewing the number of appointments booked:

Once the doctor signs in, he/she can view the number of appointments being booked for a single day and for the whole month by the patients in the application.

DT2 – Modification/Update done by the doctor:

Once the doctor signs in, he/she can modify/update their available timings in the application.

The Special purpose targets achieved in the application are,

ST1 – Database Access or Handling:

The database handling can only be accessed by the admin where he/she can have a view of the list of registered users on the application and he/she has the access to the master server for their region which has the whole database used by the

application. Suppose if we want to add extra assistance in a city or country, the admin makes a login into the database and then he/she adds the extra assistance in the city or country.

ST2 – Feedback Message of Booked Appointment:

Once the booking of the appointment been done, the user will get a confirmation message of booking to their registered mail id and mobile numbers.

2.2.2 Value-added requirements:

- New updates of the assistance can be added directly to the application database by the admin.
- Simple and user-friendly environments will be adapted in future updates.

2.3. UML Diagram:

The UML diagram shows the detailed classes in each phase of the architecture. The relationship with each class is clearly shown in the below diagram.

2.3.1 Class Diagram:

The purpose of the class diagram to model the static view of an application. Class diagrams are the only diagrams that can be directly mapped with object-oriented languages and thus widely used at the time of construction.

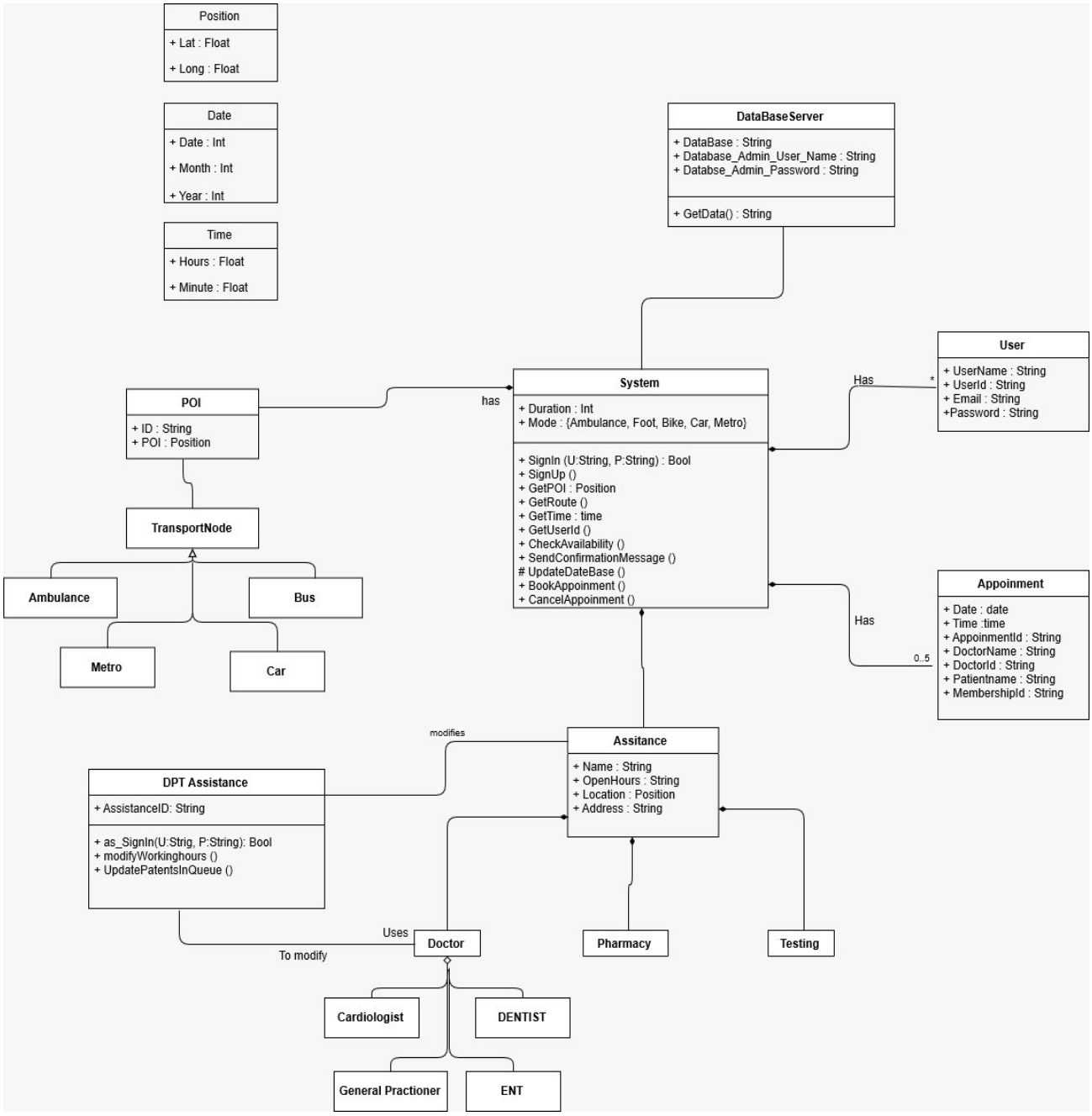

Figure 8 UML Class Diagram

2.4 Sequence Diagram:

Sequence diagrams describe the interaction among classes in terms of an exchange of messages over time. They're also called event diagrams. A sequence diagram is a good way to visualize and validate various runtime scenarios. These can help to predict how a system will behave and to discover responsibilities a class may need to have in the process of modelling a new system.

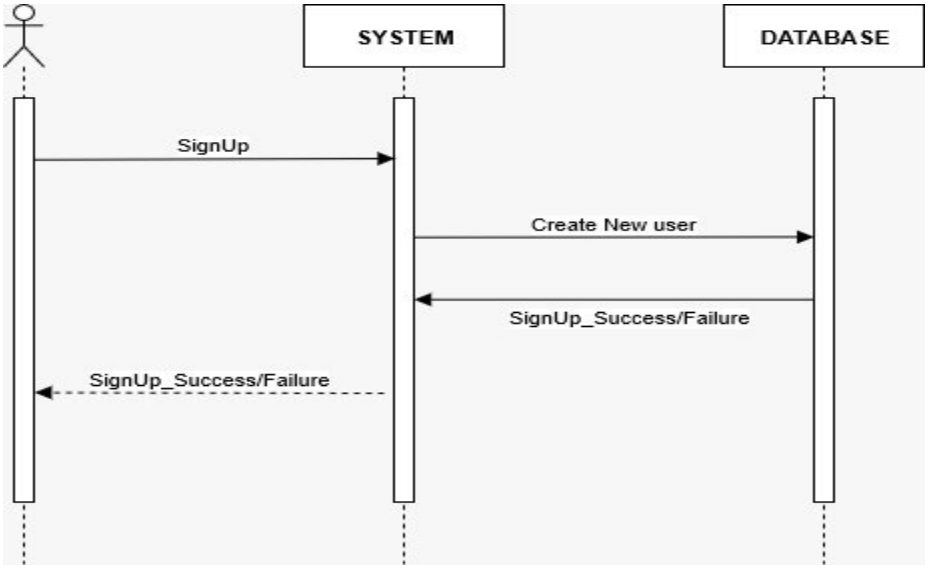

Figure 9 SignUp Sequence Diagram

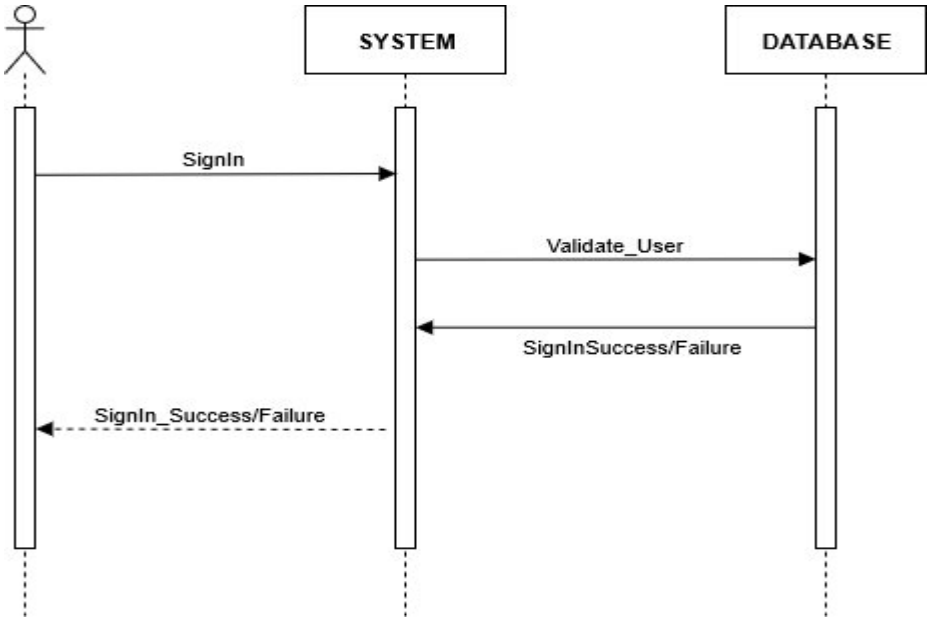

Figure 10 SignIn Sequence Diagram

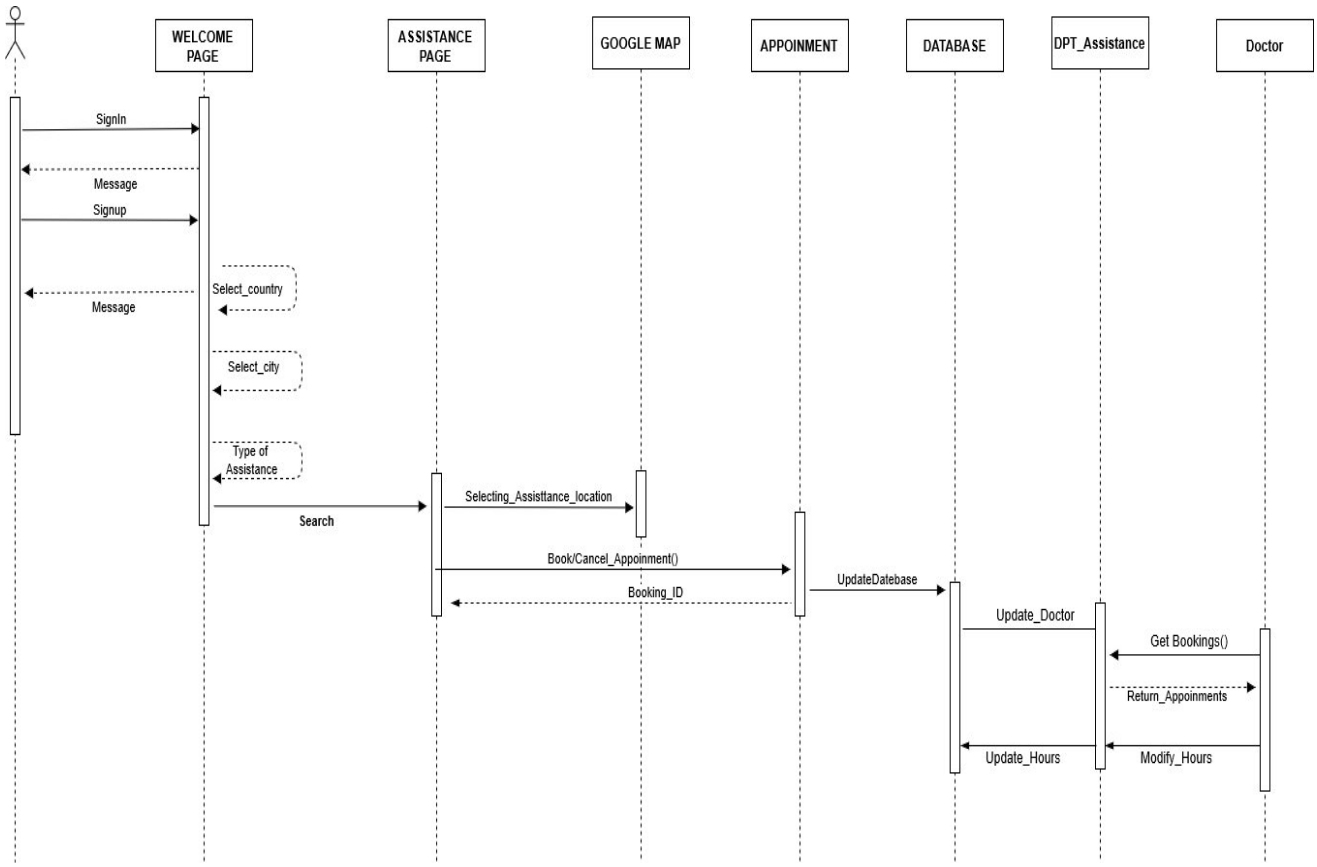

Figure 11 Complete Sequence Diagram

2.5. Flow Chart Diagram:

A flow chart is another important diagram to describe the dynamic aspects of the system. It is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. There are two types of users in our application. One is Patient and another is a Doctor.

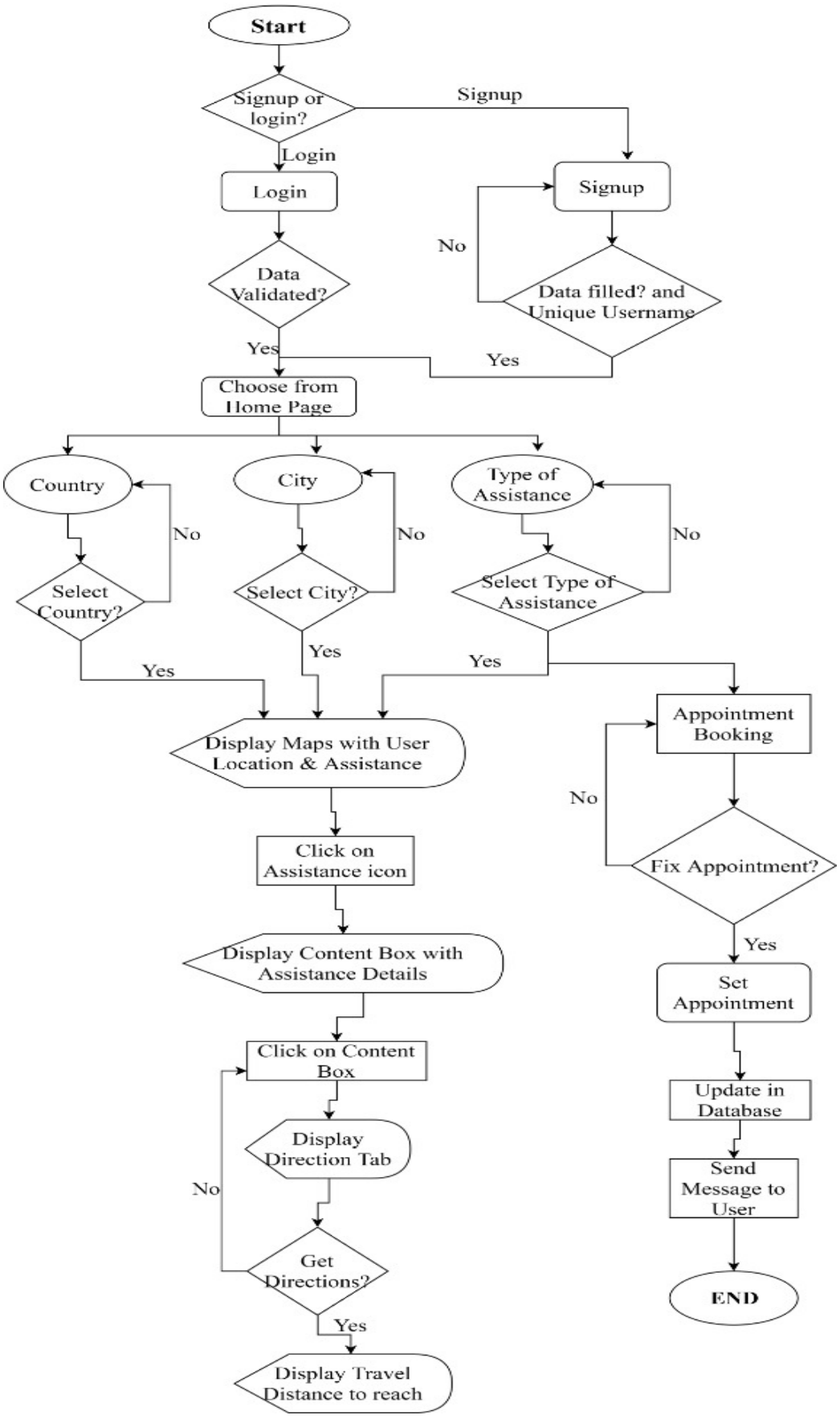

Figure 12 User's Flowchart

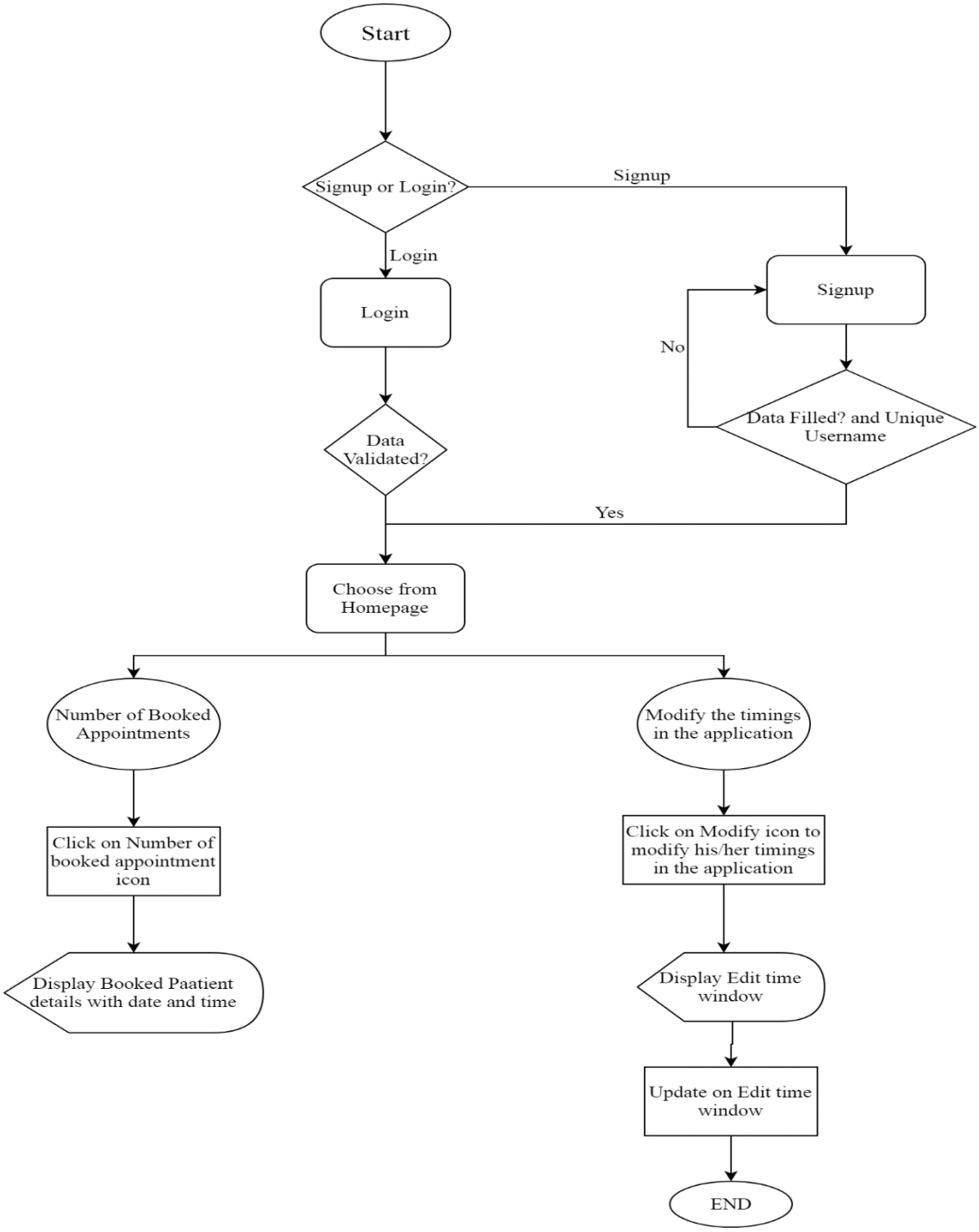

Figure 13 Doctors Flowchart

CHAPTER 3

3.1 INTRODUCTION:

3.1.1 PURPOSE:

The Integration Test Plan document is intended to indicate the necessary tests in order to verify that all the components of the previously described system are properly integrated. This document is important to verify the total work done in the application. All the test cases are identified and are described in order. Data transfer between the modules is tested thoroughly. The data are assumed and tested practices to verify the "Expected Output". Final Results match with excepted output to verify the operation of the application.

The product "Mediassist" is a simple medical application.

There are two types of tests used:

- Integration Testing
- User Acceptance Testing (Done by the Professor)

3.1.2 REFERENCE DOCUMENTS:

The Integration Test Plan Document has been composed following the indications reported in the previous documents delivered for this project: the Requirements Analysis and Specification Document, describing fundamental aspects of MediAssist such as goals, functional and non-functional requirements, and the Design Document, which shows more accurately all the functionalities provided by focusing on the software design of the system.

With regards to the course named Software Engineering 2 and held by professor Matteo Rossi (Politecnico di Milano, a. y. 2018/19), the document conforms to the guidelines provided during the lectures and within the material of the course.

3.2. INTEGRATION STRATEGY:

Testing of Mediassist mobile application was carried out by running each case on the application and the results are observed.

Since this application has a quite medium number of functionalities consisting of a lot of lines of codes, the development team decided not to do the conventional testing of each individual components and integrations of those individual components, Instead, all the features and functionalities of the application were checked by directly using the application.

Results were recorded one by one and noted in tables which will be shown in the next sections. All the tests turned out to be successful as expected. The test cases are illustrated in the following tables. The Professor will help us to make the alpha testing of the app “User Acceptance”.

3.3 PROGRAM STRUCTURE:

- We have used the expo platform where we can generate the script both for Android and Ios at a time. As we are not focusing on one platform, so we have used the expo platform to develop this “Mediassist” application.
- The “App.js” script file, contains the configuration of the database which contains database authentication domain, Database URL and storage bucket and also here we are showing what should be displayed initially in the app.
- In the “App.Json” script file we are showing it what platforms the application will be supported and here the application is supported in Android, Ios. The API key is the free version that we have generated from google maps.
- In the “AppNavigator” javascript file we are storing what should be displayed in sequence and initially, we are showing home screen and for that, we are switching to “Homescreen.js”.
- In “Homescreen.js”, we have included “Welcome to Mediassist”, Select Country, Select City and Select type of Assistance option. For Select City option we have included only the Milan region. For the “Type of Assistance” option we have kept Cardiologist as the default option which is displayed on the home screen. And for “Type of Assistance” we have included for types of assistance like Cardiologist, Dentist, Practioner, and Pharmacy. In the Button script loop, we have included the script to search and to switch to the assistance navigator map by clicking on the “search icon” in the application.

- In the “AppNavigator.js” file, what assistance we have selected, will go to that specific assistance screen and for that, we have written the code in this file under the “CreateStackNavigator” loop.
- In “Contacts.js” file, we have put integration with the google maps here and also in “export default class contacts”, we have given the Mian Mpa as the default coordinate in google map. We have used some special functionalities to show the user location in the google map and for that, we have used the “GetLocation=async()” function to show the user GPS location. We have a separate library at the top, for example, “my location Map Marker” which is used to show where the user is and where he/she is turning around. In “GetlocationAsync” we have given the access to permit user location and also, we are setting the latitude and longitude of the user location and it will be changed automatically in the “export default” class. The “Listmapmarker=>” means all the database of specific assistance is taken and injected in the “OnCalloutpress” URL which is used to do navigating from our current location to the destinated location. “Marker” command is used here to indicate all the assistance in the map and after clicking on the assistance in google map, a new content box will be opened and for that content box, we have written the title and description in “co Ordinator” loop for inserting in content box and clicking on the content box, it will be redirected to destination of assistance.
- In “Doclist.json” file contains the mock data which is used as a reference and we have put those in DB. In the “Package.json” file we used to connect it to Android, Ios and to work on it. Dependencies are the libraries that contain all the node modules. Example “React native” library is used for map navigation and the “React native tab view” library is used to show the google map tab. In “Styledtext.js” we have used mono text and for colour and layout, we wrote the separate script for it and so that if we change it, it will be automatically changed in the application.

3.4. TEST PROCEDURE:

The testing procedure we followed was “Blackbox Testing”, as stated in the lecture notes for our application, which requires a lot of pre and post-conditions that must hold before and after the program is executed for it to behave correctly. The

following test document will include the test case, test data, Output, excepted output, and the results.

3.4.1 Test Data Base Scenario:

In Table 1, database the initial step will be to add an object and here the test case added is successful and the special purpose target ST1 mentioned in chapter 2 is achieved.

Test Case (TP1)	Test Data	Output	Excepted Output	Result
Creating an object on the database	Adding "Username" on DB	Data are written on DB "Successful"	Data are written in DB	Test case successful.

Table 1 Testing of Creating Object function in a Database

In the next step (Table 2) we are creating the values on the database to include a large amount of data. Here the test case added is successful and the special purpose target ST1 mentioned in chapter 2 is achieved.

Test Case (TP2)	Test Data	Output	Excepted Output	Result
Creating value on Database	Adding "Value type" on DB	Data are written on DB "Successful"	Data are written in DB	Test case successful.

Table 2 Testing of Creating Value in a Database

In Table 3, we are adding the attributes in the database to specify each of the individual assistance. Here the test case added is successful and the special purpose target ST1 mentioned in chapter 2 is achieved.

Test Case (TP3)	Test Data	Output	Excepted Output	Result
Adding Attribute in the object on Database	Adding "Package Status" on DB	Attribute added on DB "Successful"	Attribute added on DB	Test case successful.

Table 3 Testing Attribute adding function in a Database

In Table 4, we are making a simple edit of the attribute in an object of the database and here the test case added is successful and the special purpose target ST1 is achieved.

Test Case (TP4)	Test Data	Output	Excepted Output	Result
Simple editing of an attribute in the object on Database	Modify "Package Status" on DB	All Attributes listed on DB "Successful"	All Attributes listed on DB	Test case successful.

Table 4 Testing, attribute editing function in a Database

In Table 5, we are uploading all the bulk elements of the assistance from the docfinder.json file. Here the test case added is successful and the special purpose target ST1 mentioned in chapter 2 is achieved.

Test Case (TP5)	Test Data	Output	Excepted Output	Result
Uploading all bulk elements on Database	Added the list to the Database	Added Attributes listed on DB "Successful"	All Attributes listed on DB	Test case successful.

Table 5 Testing of Bulk adding attribute function in a Database

In Table 6 we are reading all the attributes written in the database is correct or not and here the test case added is successful and the special purpose target ST1 is achieved.

Test Case (TP6)	Test Data	Output	Excepted Output	Result
Reading all Attribute of an object on DB	Read all package status	Object downloaded from the DB "Successful"	Object downloaded from the DB	Test case successful.

Table 6 Testing of Reading all attributes of an object in a Database

3.4.2 TARGETS:

In Table 7, we have shown the test case for Doctor viewing the number of booked appointments by the user and as mentioned in Doctor's target (DT1) in chapter 2 is not achieved here because as we are still in developing mode.

Test Case (TP7)	Test Data	Output	Excepted Output	Result
Doctor viewing of the number of booked appointments.	Doctor signs in to check the number of booked appointments.	A new pop-up window not displayed.	A new pop-up window not displayed.	Not Applicable as we are still in developing mode.

Table 7 Testing of Appointments booked.

In Table 8, we have shown the test case for Doctor modifying his/her timings in the application and as mentioned in Doctor's target (DT2) in chapter 2 is not achieved here because as we are still in developing mode.

Test Case (TP8)	Test Data	Output	Excepted Output	Result
Doctor modifying his timings in the application.	The doctor clicks on modify timings after signing in.	A new pop-up window not displayed.	A new pop-up window not displayed.	Not Applicable as we are still in developing mode.

Table 8 Testing of modifying timings by a doctor.

In Table 9, we have shown the test case for Doctor modifying his/her queue number in the application and as mentioned in Doctor's target (DT3) in chapter 2 is not achieved here because as we are still developing mode.

Test Case (TP9)	Test Data	Output	Excepted Output	Result
Doctor updates the queue number in the application	The doctor clicks on the update queue after signing in.	A new pop-up window not displayed.	A new pop-up window not displayed.	Not Applicable as we are still in developing mode.

Table 9 Testing of updating queue number by a doctor

In Table 10, we have shown the APK file generation test case from the Expo platform and the targeted result was successful in this case.

Test Case (TP10)	Test Data	Output	Excepted Output	Result
APK Generated	Generating the APK File from Expo.	Application Successfully installed in the device	Application installed in the device	Test case successful.

Table 10 APK generation Testing

3.4.3 DATABASE: Special Purpose Targets

In Table 11, we have shown the test case for signing in the database and also to handle the database to add new assistance and the special purpose target (ST1) mentioned in chapter 2 is achieved and the test case is successful.

Test Case (TP11)	Test Data	Output	Excepted Output	Result
New Assistance Addition	Admin Clicks on Sign in, Enter Email id & Password	Signed in “Successful”	Signed in	Test Case Successful

Table 11 Testing of new assistance addition function in a Database

In Table 12, we have shown the test case for signing in the database and also to handle the database to add new attributes to each assistance and the special purpose target (ST1) mentioned in chapter 2 is achieved and the test case is successful.

Test Case (TP12)	Test Data	Output	Excepted Output	Result
Adding New Attribute	Click so on DB Authentication Tab	New entry for adding attribute "Successful"	New entry for adding an attribute	Test Case Successful

Table 12 Attributes adding to assistance testing

In Table 13, we have shown the test case for sending the confirmation message of booked appointment back to the user and the special purpose target (ST2) is not yet achieved in this case because as we have developed only the tested version and the results will be achieved in the future.

Test Case (TP13)	Test Data	Output	Excepted Output	Result
Sending the Confirmation message of Booked Appointment	Automatic generation of the confirmation message done in the program	Send Confirmation message is "Unsuccessful"	Send Confirmation message is "Unsuccessful"	Not Applicable as we are still in developing mode

Table 13 Sending Confirmation message testing

3.4.4 MOBILE HOME SCREEN:

In Table 14, test case we have shown the display of Home screen in the mobile phone and the user's target which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP14)	Test Data	Output	Excepted Output	Result
Visibility of the Home screen	User clicks on "Mediassist" Application	Home Screen is Visible "Successful"	Home Screen is Visible	Test Case Successful

Table 14 Testing the home visibility screen

3.4.5 ASSISTANCE SELECTION:

In Table 15, test case we have shown about the selection of the country in the application and the user's target(T1) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP15)	Test Data	Output	Excepted Output	Result
Selecting the Country	User clicks on the "Country" tab	The country selected is displayed "Successful"	Country Selected is displayed	Test Case Successful

Table 15 Testing of the country selection option

In Table 16, test case we have shown about the selection of the city in the application and the user's target(T1) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP16)	Test Data	Output	Excepted Output	Result
Selecting the City	User clicks on the "City" tab	The city selected is displayed "Successful"	City Selected is displayed	Test Case Successful

Table 16 Testing of the country selection option

In Table 17, test case we have shown about the selection of the assistance in the application and the user's target(T2) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP17)	Test Data	Output	Excepted Output	Result
Selecting the type of Assistance	User clicks on the "Type of Assistance" tab	Type of Assistance selected is displayed "Successful"	Type of Assistance is displayed	Test Case Successful

Table 17 Testing of the assistance selection option

In Table 18, test case we have shown about the working of the search icon in the application and the user's target (T1, T2) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP18)	Test Data	Output	Excepted Output	Result
Search	The search icon is selected	Search has done Successfully	Search has done Successfully	Test Case Successful

Table 18 Testing of the search operation

3.4.6 VISIBILITY OF MAP:

In Table 19, the test case we have shown about the visibility of Map in the application and the user's target(T3) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP19)	Test Data	Output	Excepted Output	Result
Visibility of Map	User see the Map	Ideal Milan Region	Ideal Milan Region	Test Case Successful

Table 19 Testing of map visibility according to the selection

3.4.7 VISIBILITY OF ASSISTANCE:

In Table 20, the test case we have shown about the visibility of Map in the application and the user's target(T3) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP20)	Test Data	Output	Excepted Output	Result
Visibility of User Location	User clicks the re-centring button	Shows his/her Current Location "Successful"	Shows his/her Current Location	Test Case Successful

Table 20 Testing of map visibility according to the selection

In Table 21, test case we have shown about the visibility of Cardiologist in the application and the user's target(T3) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP21)	Test Data	Output	Excepted Output	Result
Visibility of Cardiologist	User see the list of Cardiologist in Map	List of available Cardiologist "Successful"	List of Available Cardiologist	Test Case Successful

Table 21 Testing of the cardiologist search

In Table 22, test case we have shown about the visibility of the Dentist in the application and the user's target(T3) which is mentioned in chapter 2 is achieved I and the tested successfully.

Test Case (TP22)	Test Data	Output	Excepted Output	Result
Visibility of Dentist	User see the list of Dentist in Map	List of available Dentist "Successful"	List of available Dentist	Test Case Successful

Table 22 Testing of the dentist search

In Table 23, test case we have shown about the visibility of the General Practitioner in the application and the user's target(T3) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP23)	Test Data	Output	Excepted Output	Result
Visibility of General Practitioner	User see the list of General Practitioner in Map	List of available General Practitioner "Successful"	List of available General Practitioner	Test Case Successful

Table 23 Testing of the dentist search

In Table 24, the test case we have shown about the visibility of Pharmacy in the application and the user's target(T3) which is mentioned in chapter 2 is achieved and tested successfully.

Test Case (TP24)	Test Data	Output	Excepted Output	Result
Visibility of Pharmacy	User see the list of Pharmacies in Map	List of available Pharmacies "Successful"	List of available Pharmacies	Test Case Successful

Table 24 Testing of Pharmacy search

3.4.8 MAP:

In Table 25, test case we have shown a zoom in and zoom out of the map to find the exact location and the result of the test case was successful.

Test Case (TP25)	Test Data	Output	Excepted Output	Result
Zoom in & Out	User dragging by click	Map enlarge & shrinks "Successful"	Map enlarge & shrinks	Test Case Successful

Table 25 Testing of zoom in/out function on a map

In Table 26, test case we have shown a zoom-in of the map by tapping on the map to find the exact location and the result of the test case was successful.

Test Case (TP26)	Test Data	Output	Excepted Output	Result
Zoom in	User tapping on the spot	Zooming in "Successful"	Zooming in	Test Case Successful

Table 26 Testing of zoom in/out function on a map

3.4.9 ASSISTANCE SELECTION:

In Table 27, test case we have shown the selection of cardiologist by clicking on its icon in the map and a small content-box opens with the information of assistance and so the user's target (T4, T5) mentioned on chapter 2 is achieved and the result of the test case was successful.

Test Case (TP27)	Test Data	Output	Excepted Output	Result
Cardiologist Selection	A user clicking on Cardiologist marker	Small pop up window appears, Content Display "Successful"	Small pop up window appears, Content Display	Test Case Successful

Table 27 Testing of cardiologist selection in the map assistance page

In Table 28, test case we have shown the selection of dentist by clicking on its icon in the map and a small content-box opens with the information of assistance and so the user's target (T4, T5) mentioned on chapter 2 is achieved and the result of the test case was successful.

Test Case (TP28)	Test Data	Output	Excepted Output	Result
Dentist Selection	A user clicking on Dentist marker	Small pop up window appears, Content Display "Successful"	Small pop up window appears, Content Display	Test Case Successful

Table 28 Testing of dentist selection in the map assistance page

In Table 29, test case we have shown the selection of General Practitioner by clicking on its icon in the map and a small content-box opens with the information of assistance and so the user's target (T4, T5) mentioned on chapter 2 is achieved and the result of the test case was successful.

Test Case (TP29)	Test Data	Output	Excepted Output	Result
General Practitioner Selection	A user clicking on General Practitioner marker	Small pop up window appears, Content	Small pop up window appears,	Test Case Successful

		Display "Successful"	Content Display	

Table 29 Testing of dentist selection in the map assistance page

In Table 30, test case we have shown the selection of Pharmacy by clicking on its icon in the map and a small content-box opens with the information of assistance and so the user's target (T4, T5) mentioned on chapter 2 is achieved and the result of the test case was successful.

Test Case (TP30)	**Test Data**	**Output**	**Excepted Output**	**Result**
Pharmacy Selection	A user clicking on Pharmacy marker	Small pop up window appears, Content Display "Successful"	Small pop up window appears, Content Display	Test Case Successful

Table 30 sting of pharmacy selection in the map assistance page

In Table 31, we have shown the test case for the get back by checking the application moving backward to the previous screen and the result of the test case was successful.

Test Case (TP31)	**Test Data**	**Output**	**Excepted Output**	**Result**
Going back	User clicks back	Going back to the home screen	Going back to the home screen	Test Case Successful

Table 31 Testing of going back function from the map assistance page

In Table 32, we have shown the test case for booking appointment of the doctor by just tapping on book appointment option in the content box and the user's target(T6) as mentioned in chapter 2 is not achieved here because of the application is still under developing mode.

Test Case (TP32)	Test Data	Output	Excepted Output	Result
Book Appointment	A User clicking on the content box and selects the book appointment option.	Appointment Tab window not displayed	Appointment Tab window not displayed	Not Applicable as we are still in developing mode

Table 32 Testing of Booking Appointment

3.4.10 DIRECTION:

In Table 33, we have shown the test case for displaying the direction tab and also to get directions by just clicking on the content box in the map and also as mentioned about the user's target(T7) was achieved and the result achieved in this test case was successful.

Test Case (TP33)	Test Data	Output	Excepted Output	Result
Get Directions	A user clicking on content-box	Direction tab appears "Successful"	Direction tab appears	Test Case Successful

Table 33 Testing of Booking Appointment

In Table 34, we have shown the test case for displaying the redirection to google map window and also to get directions by just clicking on the icon in the direction tab and also as mentioned about the user's target(T8) was achieved and the result achieved in this test case was successful.

Test Case (TP34)	Test Data	Output	Excepted Output	Result
Get Directions	Click on the icon & clicking the direction tab	User redirected to google maps "Successful"	User redirected to google maps	Test Case Successful

Table 34 Testing of google transport assistance

3.5. POST SURVEY RESULTS:

We conducted the post-survey with the alpha version of the app and we obtained the following ratings.

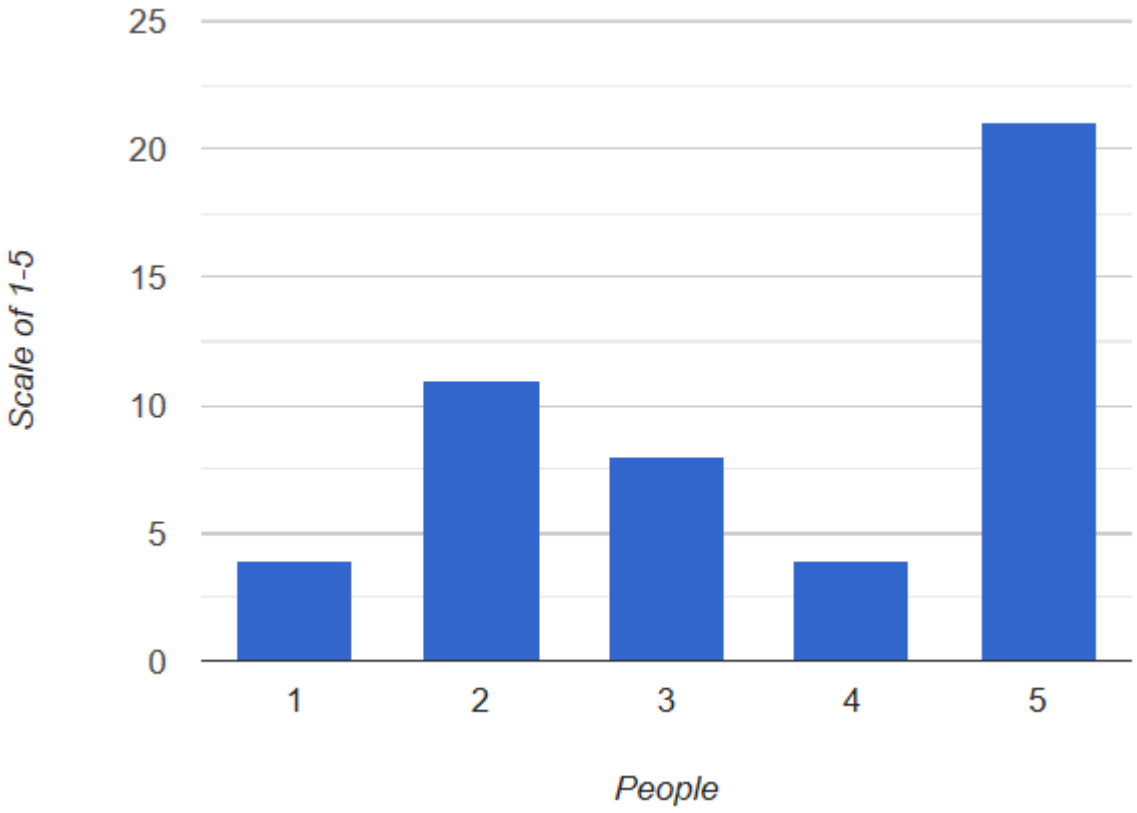

Figure 14 Post Survey Results

CHAPTER 4

4.1 FUTURE WORK

Till now we have developed an application that shows the nearby doctors, pharmacy nearby a user based on the GPS location. In the next phase (i.e., in future) we will improvise the application by adding an appointment, managing the medical records, phone medicine, medicine door delivery and mainly we will improvise our search function by showing the best hospital to reach from the user location.

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APPENDIX

1. APP DESIGN

- The application background is kept is white because of the purity.
- The logo is made entirely of blue because the colour represents trust loyalty sincerity faith.

2. PICTURES

2.1 Logo

2.2 Application Pictures