## **GUJARAT TECHNOLOGICAL UNIVERSITY**

Chandkheda, Ahmedabad Affiliated





### SHANTILAL SHAH ENGINEERING COLLEGE

A Report On-

## **SMART ASSISTANCE**

Under
B. E. IV, Semester – VII
INFORMATION & TECHNOLOGY

# Submitted by: TEAM ID: 59655

Sr.	Name of student	Enrolment No.
1.	Ghanta Sarfaraz	130430116031
2.	Jadeja Harshvardhansinh	130430116043

**D D Sanghani** (Faculty Guide)

Prof. B. V. Buddhdev
Head of the Department
Academic year
(2016-2017)



#### **CERTIFICATE**

This is to certify that the work embodied in this thesis entitled "SMART ASSISTANCE" was carried out by Ghanta Sarfaraz (130430116031) at Information Technology Department of Shantilal Shah Engineering College, Bhavnagar in Partial Fulfilment of the Requirements for the Degree of B.E. to be awarded by Gujarat Technological University. This work has been carried out under my supervision and it is up to my satisfaction.

Date:

Place: Bhavnagar

**D D Sanghani** Asst. Professor(IT), SSEC ,Bhavnagar

Prof. B. V. Buddhdev HOD, Information Technology Department SSEC ,Bhavnagar



#### **CERTIFICATE**

This is to certify that the work embodied in this thesis entitled "SMART ASSISTANCE" was carried out by Jadeja Harshvardhansinh (130430116043) at Information Technology Department of Shantilal Shah Engineering College, Bhavnagar in Partial Fulfilment of the Requirements for the Degree of B.E. to be awarded by Gujarat Technological University. This work has been carried out under my supervision and it is up to my satisfaction.

Date:

Place: Bhavnagar

**D D Sanghani** Asst. Professor(IT), SSEC ,Bhavnagar Prof. B. V. Buddhdev HOD, Information Technology Department SSEC ,Bhavnagar

### **ACKNOWLEDGEMENT**

Every work that one completes successfully sends on the constant encouragement, good will and support of the people around. I, hereby, avail this opportunity of express my heartfelt gratitude to a number of people who extended their valuable time, full support and co-operation and developing this project.

I would like to place on record our deep sense of gratitude to Prof. **B.V.BUDHDEV**, HOD-Dept. of Information & Technology Engineering, SSEC, Bhavnagar, for his generous guidance, help and useful suggestions.

I express our sincere gratitude to Prof. **D D Sanghani**, Dept. of Information & Technology Engineering, SSEC, Bhavnagar, for her stimulating guidance, continuous encouragement and supervision throughout the course of present work.

I also wish to extend our thanks to our family and other colleagues for attending our seminars and for their insightful comments and constructive suggestions to improve the quality of this report work.

•

## Prepared by:

**Ghanta Sarfaraz M** (130430116031)

Jadeja harshvardhansinh G (130430116043)

### **Abstract**

Now a days we require to visit many types of service provider like doctor, hair dresser, astrologer, charter accountant, lawyer, beautician etc. all this types of service provider are busy if they are popular in their business. And getting appointment is headache for anyone, once you get appointment you have to wait for 1 or 2 hour to get your turn for one to one talk and get treatment or consultation from experts. So this problem can be solved with help of kind a unique app we called it "Smart Assistance".

Smart Assistance is app which allows service provider and consumer to send and receive notification about their upcoming appointments as well as it can be also used to book appointments.

Main features of application will be:

- 1) In-app appointment booking & confirmation and in app notification about your turn
- 2) Manage queue of clients in waiting for professionals listed above
- 3) Client can also pay online, if they wish
- 4) Provide facility to service provider to create the profile and rate card
- 5) Maintain queue for service provider
- 6) One click super easy turn intimation to client
- 7) Provide facility to client to write review about their experience.

## **INDEX**

Sr. No	TOPIC	Page No
1	INTRODUCTION	
	1.1 Project Profile	8
	1.2 Project Definition	9
	1.3 Project Aim	10
	1.4 Project Purpose	10
	1.5 Project Scope	11
	1.6 Project Module & Literature Review	11
2	SYSTEM REQUIRENMENT STUDY	
	2.1 Hardware and Software Requirement	13
3	PROJRCT MANAGEMENT	
	3.1 Project Planning	14
	3.2 Time Line Chart	14
	3.3 Process Model	15
4	SYSTEM ANALYSIS	
	4.1 System Analysis Overview	20
	4.2 Feasibility Study	20
	4.3 Technology Used	21
5	System Design	
	5.1 Design Engineering Canvas Sheets	25
	5.2 UML Diagrams	34
	5.3 Data Dictionary(Database)	39
6	SUMMARY	
	6.1 Conclusion	44
	6.2 Reference	44

CHAPTER: 1	
INTRODUCTION	
7	

## 1.1 PROJECT PROFILE

**Project Title** : Smart Assistance

**Project Type** : Web Based Application

Objective : To Develop an Android app on Appointment System

**Technology** : Android

**Purpose** : B.E.IT, (7<sup>th</sup> Semester)

**Submitted to** : Shantilal Shah Engineering College

**Developed By** : Jadeja Harshvardhansinh G (130430116043)

Ghanta Sarfaraz M (130430116031)

#### 1.2 Problem Definition

As we all are living in the new era of technology, it is supposed to have everything surrounding us smart and technically advanced. As in this era everybody use to have a smartphone and an increasing use of the smart android app strikes us to have everything inside an app. Every organization, private and public companies, stakeholders, universities, colleges etc. used to have their own smartphone applications.

Everybody used to complete his/her work in time and booking an appointment is one of the way to complete the work in time. Over a past few years booking an appointment has grown popularity over whole world, many organizations, businesses, universities, hospitals, hairstylist, charter accountant, astrologer etc. uses some web-based online appointment management system which helps them to have their work done on time bases.



An online appointment management system allows patients to book appointment to specific doctor, a student to register and apply for book appointment, an organization to held meetings, appointments for job etc.

In This report we have discussed about creating an android app for the various places where there is likely to have a queue and booking an appointments to remove the queues.

### 1.3 Project Aim

Smart Assistance is being developed with the aim to reduce the effort of standing and waiting in a Queue while taking an appointment and to provide the smart way to book an appointment.

Also its different Aim and Objectives are as follow:

- 1) In-app appointment booking & confirmation and in app notification about your turn
- 2) Manage queue of clients in waiting for professionals like doctor, hair dresser, astrologer, charter accountant, lawyer, beautician etc.
- 3) Client can also pay online, if they wish
- 4) Provide facility to service provider to create the profile and rate card
- 5) Maintain queue for service provider
- 6) One click super easy turn intimation to client
- 7) Provide facility to client to write review about their experience.
- 8) Easy and advanced user interface.

## 1.4Project Purpose:

The Purpose to develop the app was to do something innovative in a way that it provides the facility to everyone regarding the problem faced while booking an appointment. This app will solve the problems like wastage of time, Effort of standing in a queue. It also provides the smart access and online payment facility.

### 1.5 Project Scope

The project scope is that it must achieve the basic objective of the Problem defination. Here the basic objective is to provide effortless facility for booking an appointment.

## 1.6 Project module detail:

1 User Mod	dule:
	User Registration
	User Login
	User Profile
	List of service Provider
	Appointment History
	Booked Appointment
2. Service P	rovider Module:
	Registration
	Login
	Request List
	Approved Request
	<b>Booked Appointments</b>
	Appointment History
	•

### **□** Literature Review:

#### 1) APPOINTMENT ARBITER:

Patent No: 20060.129444A1

**Abstract:** The main information is about setting up the appointment. Firstly the request is sent from the client to the service provider, and then the respective receivers receives the notification and approves and rejects as per his/her schedule.

# 2) ON-LINE APPOINTMENT SYSTEM WITH ELECTRONIC NOTIFICATIONS

**Patent No:** 7,188,073 B1

**Abstract:** This patent discuss about the online appointment system which is used by various organizations. Notifying via electronic mail is also the feature of the patent

CHA	APTER: 2	
SYSTEM REQU	IRENMENT STUDY	Y
		12

#### 2.1 Hardware And Software Requirenment:

While developing any of the android app the technical support required is the computer system or a laptop for the development of app, an android smartphone for timely checking the developed application, Android studio for coding and Emulator or Genymotion for checking the developed application.

- ☐ Minimum hardware requirement:
  - o CPU: Intel core i3,2.5-3.1 Ghz recommended
  - o Memory (RAM): 4 or 6 GB RAM recommended

For windows user it is supposed to have a system of above mentioned specification, there is no issue with the operating system version you can use any of the version either windows 7/8/10.

The main problem arises when the Availability of RAM is less than 2GB or Less, because android studio alone requires more than 1 GB RAM and if the system is having 2GB RAM than it will hangs and the system will not work perfectly.

Even the problem arises with system having 4GB RAM, hence it is recommended to have a system with 8GB RAM, in which the tools and Android Studio will operate smoothly.

Also the disk space and the java version as above mentioned in the table.

### **Software Requirement:**

#### 1. Android Studio:

Android Studio is used for the development of the Android application, before Android Studio (Eclipse) was used for the development of the applications

#### 2. Genymotion:

Genymotion is a third party emulator used to check the developed app before deployment. It is far better than the emulator provided by the Android Studio. It is suggested to use the Genymotion instead of the Emulator.

#### 3. MySQL:

MySQL is an open-source relational database management system (RDBMS). It is used to create server side database.

## 4. Wamp Server:

Wamp Server refers to a software stack for the Microsoft Windows operating system, created by Romain Bourdon and consisting of the Apache web server, OpenSSL for SSL support, Mysql database and php programming language.)

СН	APTER: 3		
 PROJECT	MANAGEMEN	NT	
			15

### **Project Management:**

The Most important part of the project development is its management. The management decides the success and the failure of the project. Project management includes the Project planning, project scheduling and Requirement analysis Etc.

### 3.1 Project Planning:

Every work needs a well and good planning, the work done without the planning fails to reach its destination. For the Planning of our project firstly we gathered the basic information about our Problem definition. Afterwards we decided the platform to be used for the development of the project, we finally decided to develop an android application regarding our Problem definition . Then we started reading and referring the literature about the Appointment system. Then we started planning for how to collect the data and how to manage the data. Every required data regarding to Appointment system was gathered by us and started planning to manage those data.

#### 3.2 Time Line Chart:

Activity	Ju	ne		Ju	ıly	S	epte	mbe	r	Octo	ober	
Domain Understanding												
Analysis												
Learning Process												
Design												

### 3.3 Process Model – The Incremental Model

As we are developing the Appointment Application for the first time there is supposed to be increment in the future, the increments that are covered during the development are as follow:

### **Core Application:**

The basic functionalities we have approached are to analysis our project.

### ☐ Increment 1:

We have implemented from designing modules as our first increments.

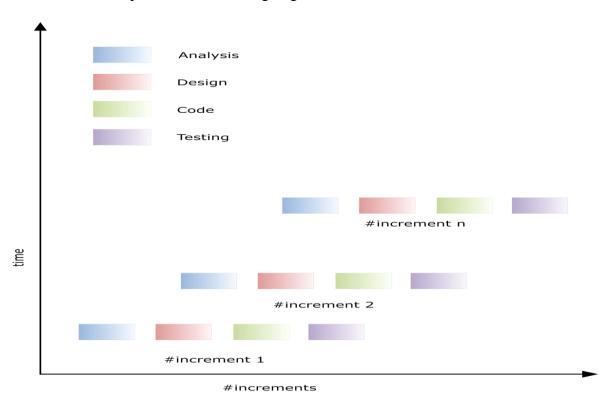


Figure 4. 1incremental model

The Incremental model encompasses the following activities:

- 1. System/Information Engineering and Modeling:
- 2. Software requirements analysis:
- 3. Design:
- 4. Code generation
- 5. Testing
- 6. Maintenance

CHAPTER: 4  SYSTEM ANALYSIS		
	SYST	C
	TEM AN	CHAPTI
iS	NALYSI	E <b>R: 4</b>
	IS .	

#### 4.1System analysis overview:

The process of gathering the information, diagnosing problems and using the needed information for the improvement of the system is said to be the system analysis. Interaction between the user and the developer is given the prime importance in the system analysis, as being a problem solving activity continues and intensive communication between user and developer is most importance.

The system is deeply studied and analyzed, as the system analysis is the important phase of any system development process. The system analyst plays the role of an interrogator and dwells deep into the working of the present system. The system is viewed as a whole and the inputs to the system are identified. The outputs from the organization are traced through the various processing that the inputs phase through in the organization.

A detailed study of these processes must be made by various techniques like Interviews, Questionnaires etc. The conclusion is an understanding of how the system functions. This system is called the existing system. Now, the existing system is taken under study and the problematic arears are strike out. The designer now functions as a problem solver and tries to sort out the difficulties that the enterprise faces. The solutions are given as a proposal. The proposal is then weighed with the existing system analytically and the best one is selected. The proposal is presented to the user for an endorsement by the user. The proposal is reviewed on user request and suitable changes are made. This loop ends as soon as the user is satisfied with the proposal.

## 4.2 Feasibility study:

## ☐ Operation feasibility:

As the app is developed using the android mobile operating system the user-interface (UI) will be user friendly and it is developed in such a way that a non-technical person can also operate it easily. It will be easily understandable and adaptable by everyone and also provides the widgets which help them to access it easily.

### ☐ Technical feasibility:

The app will be totally secured as the secured app are only alloweded to be launched at google play store. The most secure and trusted back end SQL with its advance features is used for database.

#### ☐ Schedule feasibility:

Every project gets Success which are developed under the perfect project planning and scheduling. To provide the quality software built the work is complete before the schedule so that the work can be given before demanded. And in additional to add further more functionality, new facility and correct the errors if any remains at the end after being Used by the end user

### **□** Economy feasibility:

Economic feasibility is the most frequent used method for evaluating the effectiveness of a new system.

#### 4.3 Technology description:

#### 1) Android:

Android is the mobile operating system developed by Google. Essentially, Google produces the software that runs almost every other mobile phone besides Apple's iPhone. There are also some popular Android tablets as well. Android is a linax-based software system, and similar to Linux, is free and open source software.

Android is a powerful Operating System supporting a large number of applications in Smart Phones. These applications make life more comfortable and advanced for the users. Hardware that supports Android is mainly based on ARM architecture platform.

	These	are the	basics	ot	Android	app.	licat	ions:
--	-------	---------	--------	----	---------	------	-------	-------

Android application	ions are c	omposed	of one	or more	application	components	(activities,
services, content	providers,	and broad	dcast red	ceivers)			

Ц	Each component performs a different role in the overall application behavior, and	each	one
	can be activated individually (even by other applications)		

	all app	anifest file must declare all components in the application and should also declare lication requirements, such as the minimum version of Android required and any are configurations required
		ode application resources (images, strings, layout files, etc.) should include tives for different device configurations (such as different strings for different ges)
2)	MYS	QL [Back end]:
		MY SQL is currently the most popular open source database server in existence.
		On top of that, it is very common used in conjunction with PHP script to create
		powerful and dynamic server-side applications.
		MY SQL has been criticized in the past for not supporting all the features of other
		popular and more expensive Database Management System.
		However, MY SQL continues to $$ improve with each release (currently version 5)
		and it has become widely popular with individuals and businesses of many
		different sizes.
<b>*</b>	What	is database?
		A database is a structure that comes in two categories: a flat database and
		a relational database. A relational database is much more oriented to the
		human mind and is often preferred over the flat database that are just stored on
		hard drives like a text file. MY SQL is relational database.
		In a relational structure database there are tables that store data. The columns
		define which kinds of information will be stored in the table. An individual column
		must be created for each type of data you wish to store (i.e. Age, Weight, Height).
		On the other hand, a row contains the actual values for these specified columns.
		Each row will have 1 value for each and every column. For example a table with
		columns (Name, Age, Weight-lbs) could have a row with the values (Bob, 65,
		165). If all this relational database talk is too confusing, don't despair. We will
		talk about and show a few examples in the coming lessons.

*	What use a Database?							
	Database are most useful when it comes to storing information that fits into							
	logical categories.							
	☐ For example, say that you wanted to store information of all the employees in							
	company. With a database you can group different parts of your business into							
	separated tables to help store your information logically.							
	☐ Example tables might be: Employees, Supervisors, and customers. Each table							
	would then contain columns specific to these three areas. To help store information							
	related to each employee, the employees table might Have the following							
	columns: Hire, Date, Position, Age, and salary.							
3) <b>PH</b>	P (Hypertext pre-processor)[Front end]:							
	PHP is an open source general-purpose, server-side scripting language originally designed							
	for web development to produce dynamic web pages.							
	It is one of the first development server sides scripting language to be embedded into an							
	HTML source document rather than calling an external file to process date.							
	The code is interpreter by a web server with a PHP processor module which generated the							
	resulting web page.							
	It is also has evolved to include a command a command line interface capability and can							
	be used in standalone graphical application.							
	PHP can be deployed on most web server and also as a standalone shell on almost every							
	operating system and platform free of charge.							

☐ A competitor to Microsoft's active server page server side scrip engine and similar

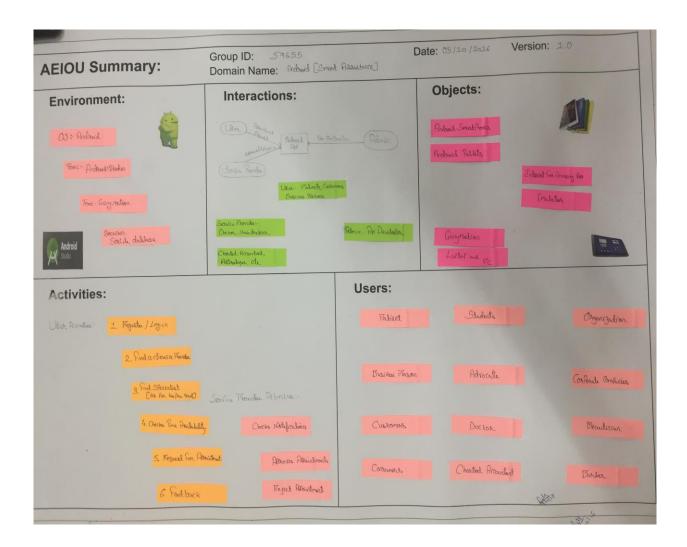
language, php is installed on more than 20 million web sites and 1 million web server.

CHAPTER: 5	
SYSTEM DESIGN	
5.1 Design Engineering Canvas	
5.1.1 AEIOU Sheet:	24

AEIOU in Sheet stands for Activity, Environment, Interactions, Objects and Users.
1.1) Activity:
It includes the various activity performed in the project
Activity is divided in the two parts:
1- User Activity: Activity performed at the user side
☐ Register/login
☐ Find the service provider
☐ Find the specialist
☐ Check time availability
☐ Request for appointment
☐ Feedback
2- Service Provider Activity: Activity performed at the Service providers end
☐ Checks notification
☐ Approve appointment
☐ Reject appointment
☐ Check history

## **5.2.2** Environment Sheet:

Environment Sheet includes the technology used in the front-end and the back- end i.e: JAVA, XML, SQLite, MYSQL, Android, PHP



## 1) Interactions Sheet:

Interaction sheets defines the interaction between the user and the service provider

- ☐ Firstly the user request for the appointment
- ☐ And the Service provider Approves/rejects according to his/her schedule.

## 2) Object Sheet:

Object Sheet includes the objects likely to be used in the projects

- ☐ Android smartphones
- ☐ Android tablets
- ☐ Computer system
- ☐ Laptop

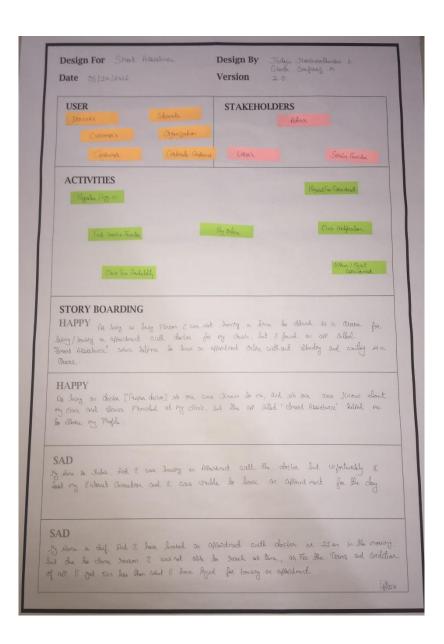
☐ Internet for accessing the app
3) Users Sheet:
Users sheet includes the users that are supposed to be interact in the project
Doctors
☐ Patients
☐ Advocates
☐ Customers
☐ Consumers
Organization
☐ Corporate company
☐ Beautician
☐ Students
☐ Charted accountant
☐ Hair dresser

## 2) Empathy Mapping:

Empathy mapping Sheet includes:

- 1) Users
- 2) Stakeholders

- 3) Activities
- 4) Story boarding

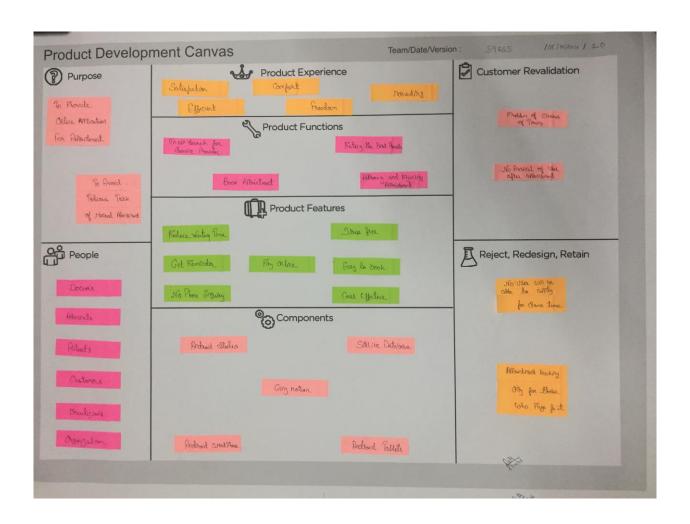


<b>*</b>	Users:	
		Doctor
		Patient
		Organization
		Corporate company
		Advocate
		Customers Etc.
*	Stake	holders:
		Admin
		Users
		Service Provider
*	Activi	ities:
		Register/Log-in
		Find Service Provider
		Check Time Availability
		Request For Appointment
		Check Notification
		Approve/Reject Appointment
*	Story	Boarding:
	ū	Happy: As being a busy person i was not having a time to stand in a queue for
		booking appointment with doctor for my cousin, but I found an app called "Smart
		Assistance" which helped me to book my appointment without waiting in a
		queue.
		Happy: As being a fresher doctor no one was known to me and no one was known
		about the service provided at my clinic, but this app helped me to share my profile
		Sad: My name is kabir, and I was booking an appointment with doctor but
		unfortunately I lost my internet connection and I was not able to book
		appointment for the day.
		Sad: My name is Saif, and I was having an appointment with the doctor at 11am
		in the morning, but due to some reason I was not able to reach at time, as per the
		terms and conditions of app, I got 50% less than what I have paid for
		appointment.

## 3) Product Development Canvas:

It includes the below stated points:

- 1) Purpose
- 2) People
- 3) Product experience
- 4) Product features
- 5) Product functions
- 6) Components
- 7) Customer revalidation
- 8) Reject, Redesign, Retain

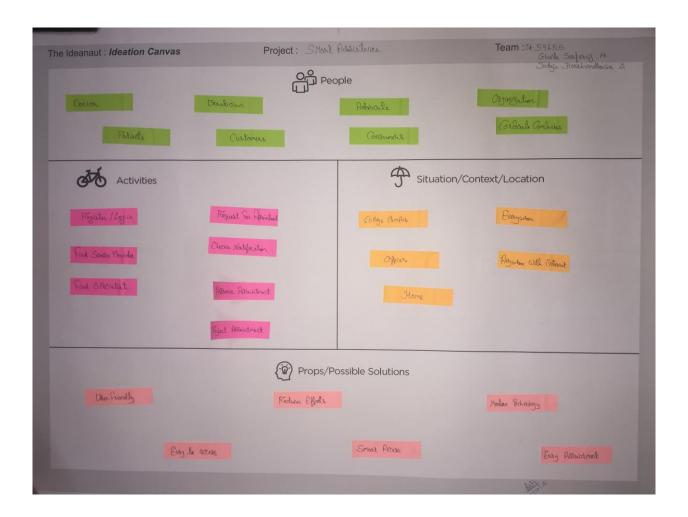


<ul> <li>1) Purpose:</li> <li>To provide online application for appointment</li> <li>To avoid Tedious task of manual appointment</li> </ul>
2) Product Experience:  Comfort Efficient Motivating Satisfaction
3) Product Features:  Reduce waiting time Get reminder Pay online No phone inquiry Stress free Easy to book Cost effective
<ul> <li>4) Customer revalidation:</li> <li>□ Problem of clashes of time</li> <li>□ No arrival of user after booking appointment</li> </ul>
<ul> <li>5) Redesign, Retain, Reject:</li> <li>□ No user will be allowed to book for same time</li> <li>□ Booking an appointment only for those who pay for it</li> </ul>

## 5) Ideation canvas:

It includes the below stated Points:

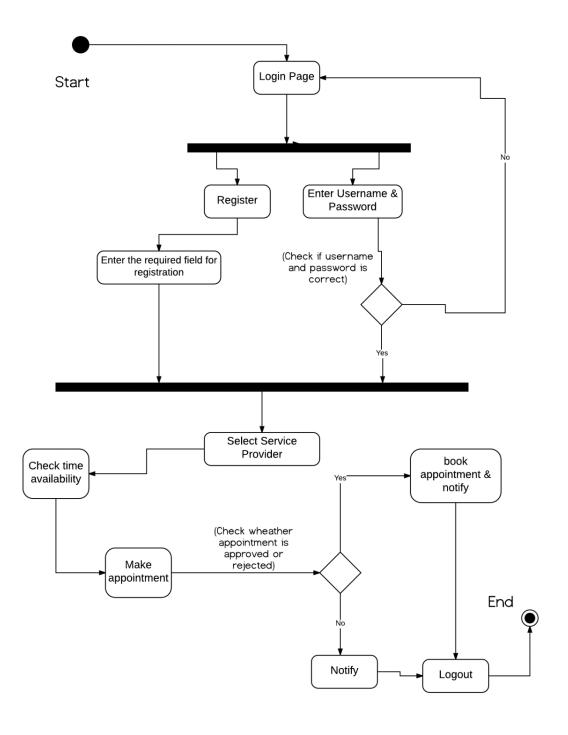
- 1) People
- 2) Activities
- 3) Situations/Context/location
- 4) Props/Possible solutions



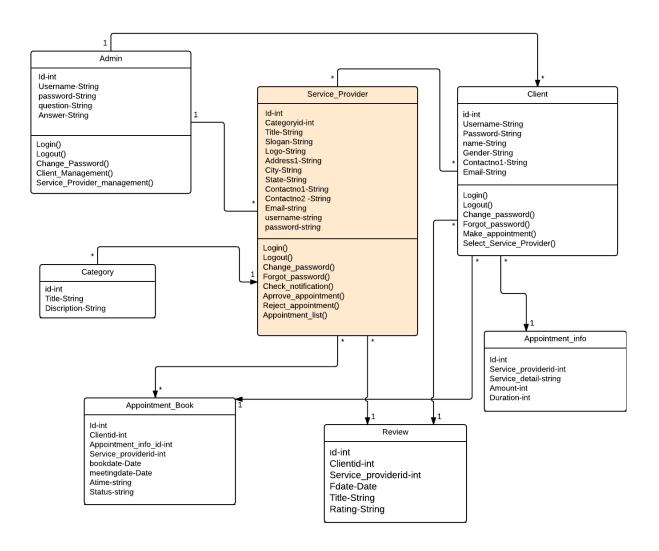
Peopl □	Doctor
	Patient
	Beautician
	Organization
	Corporate company Etc.
2) Activ	
	Register/Login
	Find service provider
	Check time availability
	Request appointment
	Check notifications
Ц	Approve/Reject appointment
3) Situa	tion:
	College campus
	Home
	Office
	Everywhere
l) Props	z•
	User friendly
	Easy to access
	Reduce efforts
ū	Smart access
	Easy appointment
	Modern technology
_	

## 5.3 UML-Diagrams

## 1) Activity Diagram:



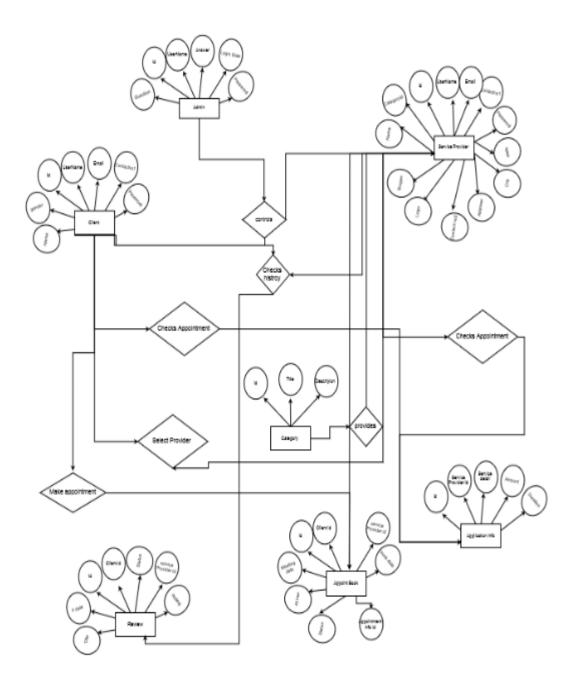
## 2) Class Diagram:



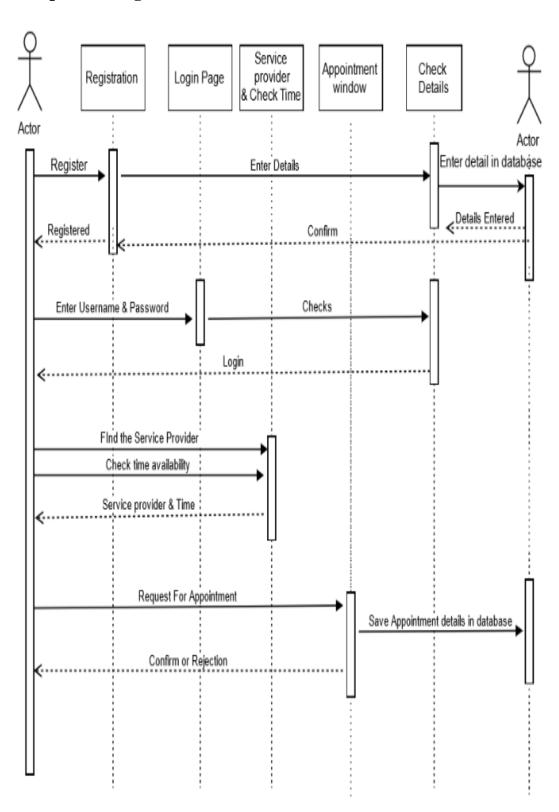
## 3) Use-Case Diagram:



## 4) ER Diagram:



## 5) Sequence Diagram:



## **5.3)** Data Dictionary (Database)

## 1) Review:

	Review					
1.	Id	Integer	Primary key	Uniquely identify each record		
2.	Clientid	Integer	Foreign key			
3.	Service_providerid	Integer	Foreign key			
4.	Fdate	Date	Not null	Date of feedback		
5.	Title	Varchar(128)	Not null	Title of the feedback		
6.	rating	Varchar(128)	Not null	Description of feedback		

## 2) Appointment Book:

	appointment_book 5					
1.	Id	Integer	Primary key	Uniquely identify each record		
2.	Clientid	Integer	Foreign key	Foreign key of client table		
3.	Appointment_info_id	Integer	Foreign key			
4.	Service_providerid	Integer	Foreign key			
5.	bookdate	Date		Book date of appointment		
6.	meetingdate	Date		Date of appointment		
7.	Atime	Text		Time of appointment		
8.	Status	Text		1=requested		
				2=accepted		
				3=rejected		

## 3) Appointment Info:

	Appointment_info					
1.	Id	Integer	Primary key	Uniquely identify each record		
2.	Service_providerid	Integer	Foreign key			
3.	Service_detail	Text		Detail of service		
4.	Amount	Int		Tentative service amount		
5.	Duration	Int		Duration of service in minute		

## 4) Service Provider:

	Service_provider [person who give appointment]					
1.	Id	Integer	Primary key	Uniquely identify each record		
2.	Categoryid	Integer	Foreign key			
3.	Title	Text	Unique, not null	Company name/shop name of service provider		
4.	Slogan	Text	Not null	Slogan of service provider		
5.	Logo	Text	Not null	Logo of service provider		
6.	Address1	Text				
7.	City	Text				
8.	State	Text				
9.	Contactno1	Text		Not null		
10.	Contactno2	Text		Not null		
11.	Email	Text				
12.	Username	Text				
13.	Password	Text				

## 5) Category:

Category [type of service provider] 1						
1.	Id	Integer	Primary key	Uniquely identify each record		
2.	Title	Text	Unique, not null	Category name of service provider such as doctor, architect, hair dresser, school college principal, police superintendent		
3.	Description	Text		Category description		

## 6) Client:

	Client [person who request appointment] 4								
	[bulk insert/update/delete/select]								
No	Name	Datatype	constraint	Remarks					
1.	Id	Integer	Primary key	Uniquely identify each user					
2.	Name	Text							
3.	Gender	Boolean							
4.	Contactno1	Text		Not null					
5.	Email	Text							
6.	Username	Text							
7.	Password	Text							

## 7) Admin:

	Administrator [mysql]							
No	Name	Datatype	constraint	Remarks				
1.	Id	Integer	Primary key	Uniquely identify each user				
2.	Username	Text						
3.	Password	Text						
4.	Question	Text						
5.	Answer	Text						
6.	Last_login_date	Date		Last login date of administrator				

	CHAPTER: 5	
	SUMMARY	
		43

## **6.1) Conclusion:**

In This Project we discuss about the appointment System which reduces the effort of the manually booking appointment with any service provider.

- ☐ The System works simply with the following Activities:
- 1) The user Finds the best available services Provider in his/her suitable location
- 2) The user will have list of Service Provider
- 3) User will request for booking appointment with his/her selected Service Provider
- 4) In response the Service Provider will Approve or reject the appointment according to his/her schedule
- 5) The provides facility of online payment
- ☐ The advantages of this android application will be as follow:
- 1) With the help of the app the user will be easily able to book the appointment with any of the listed Service Provider.
- 2) The UI of the application will be User-Friendly.
- 3) It will be easy to access
- 4) It will provides the review from users, which will help the new users to choose the best Service Provider
- 5) It will also provide the history

## **6.2) Reference:**

Ц	Appointment arbiter, Patent No: US20060129444A1
	On-line appointment system with electronic notifications, Patent No: US7188073B1
	Personal activity scheduling apparatus, Patent No: US5855006A
	Automated job scheduling based on resource availability, Patent No: US7502747B1
	Location-and direction-enhanced automatic reminders of appointments, Patent No:
	US7847686B1
	Graphical computer system and method for appointment scheduling, Patent No:
	US5970466A
	Smart appointments, Patent No: US20160203442A1