



**JEPPIAAR**  
**ENGINEERING COLLEGE**

**BMA – Blind Men’s Assistant**

**An Assistant developed specially for Blind People**

**IT8611**

**A MINIPROJECT REPORT**

*Submitted By*

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*In the partial fulfillment for the award of the degree*

*of*

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*In*

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**JEPPIAAR ENGINEERING COLLEGE**

**ANNA UNIVERSITY**

**CHENNAI - 600 025**

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**JEPPIAAR**  
**ENGINEERING COLLEGE**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

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## **BONAFIDE CERTIFICATE**

This is to certify that this Project Report “**BMA(Blind Men’s Assistant – A Assistant specially designed for Blind People)**” is the bonafide work of “**MATHESH.T** and **BALAJI.P**” who carried out the Miniproject under my supervision.

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We also thank the teaching and non teaching staff members of the department of **INFORMATION TECHNOLOGY** for their constant support.

# ABSTRACT

As per WHO records, at present in our world nearly 280 million people are impaired of whom 39 million people are blind. The biggest challenge for a blind person, especially the one with the complete loss of vision, is to navigate around places. These people have to be dependent on a normal Individual for performing day to day activities.

AI Assistants like Google Assistant, Alexa, Siri have hugely lived up to the task of helping normal person's day to day task. But these assistants fail to live up to the task replicating the same work with Blind or Disabled People. The way these assistants are designed like taking input, performing user specific actions are all been made keeping a fit and abled person as Target user.

To Overcome the above challenges and problems, BMA (Blind Men's Assistant) System is proposed in this study to achieve the following: -

- 1) To give the Blind Person specific Input by Implementing Braille Keyboard.
- 2) To gather user's medical data in first place and help them in booking Doctor Appointments.
- 3) To Assist blind user's day to day task like navigation of nearest places, getting ocr text from a book, knowing about some specific topics all through braille keyboard or voice as input.

The above function is designed mainly keeping a Blind Person as a target user and also ensuring their security of medical data's.

Therefore, the proposed model will ensure that blind men people will not have to feel dependent on others for some work and also resulting in use of better technologies for overcoming disabilities of people...

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 OVERVIEW**

As per WHO records, at present in our world nearly 280 million people are impaired of whom 39 million people are blind. The biggest challenge for a blind person, especially the one with the complete loss of vision, is to navigate around places. These people have to be dependent on a normal Individual for performing day to day activities.

AI Assistants like Google Assistant, Alexa, Siri have hugely lived up to the task of helping normal person's day to day task. But these assistants fail to live up to the task replicating the same work with Blind or Disabled People. The way these assistants are designed like taking input, performing user specific actions are all been made keeping a fit and abled person as Target user.

To Overcome the above challenges and problems, BMA (Blind Men's Assistant) System is proposed in this study to achieve the following: -

- 1) To give the Blind Person specific Input by Implementing Braille Keyboard.
- 2) To gather user's medical data in first place and help them in booking Doctor Appointments.
- 3) To Assist blind user's day to day task like navigation of nearest places, getting ocr text from a book, knowing about some specific topics all through braille keyboard or voice as input.

The above function is designed mainly keeping a Blind Person as a target user and also ensuring their security of medical data's. Therefore, the proposed model will ensure that blind men people will not have to feel dependent on others for some work and also resulting in use of better technologies for overcoming disabilities of people...

## 1.2 DOMAIN INTRODUCTION

A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. These chatbots or Assistants can be used in performing tasks such as booking appointment, setting alarm, sending message etc. These chatbots work by taking human voice or text from QWERTY keyboard as input.

However, a chatbot like these is not Blind User Friendly. Blind People are those who lost their eye sight and not familiar with normal keyboards Humans use. The blind people are more familiar Braille Keyboard as it is made with braille pattern which consists of only 6 keys.

The main of aim of BMA is introducing Braille Keyboard as Input for the Blind People which makes the chatbot blind-user friendly. Any form of query which the user has can be sent as an input through the 6 buttons.

When the User completes pressing the key/buttons then the chatbot matches the user pattern with the braille pattern and understands its output and print/speak the output. For Ex if user types 123 as input the chatbot understands L as output and prints it.

This input is further used by chatbot to understand the query the user asks and perform the function and print the output accordingly. Through this way a blind user specific chatbot BMA is Designed.

## 1.3 PROBLEM STATEMENT

Chatbots have been user friendly for fit and abled persons. Blind Persons find it difficult to use normal chatbots.

Chatbots need to have a specialized / optimized for the blind user through various functions.

The Functions are listed below: -

- 1) Chatbots needs to have braille keyboard along with voice as input.
- 2) Talkback System needs to be implemented. It is the system where chatbot speaks what is on the screen based on the user clicks.
- 3) Chatbot should be capable of storing user information and medical details and assisting them in booking doctor appointments with these information's.
- 4) Chatbot should be able to assist the user in various situations like nearby places on map, getting required info or converting OCR text.

Through these functions we can make sure a chatbot is blind user friendly.

## **CHAPTER 2**

### **LITERATURE SURVEY**

#### **2.1 LITERATURE SURVEY**

##### **1. Smart Assistant for Blind and Visually Impaired People**

**Authors:** Nourhan Tahoun, Anwar Awad and Talal Bonny

**Year:** January 2019.

**Aim:** Recognize objects and colors using Machine Learning

**Overview:** Blind or visually impaired people feel miserable and helpless when people help them in their daily simple jobs. Many of them are afraid of going out unless it's necessary. Blind people usually memorize the location of objects so they can find them without struggling, but what if the location of any object has been changed for any reason? Or what if they want to go to an outside place? How they will recognize objects? Colors are also another challenge for them. Smart Assistant for blind people is a portable device. This device will make blind and visually impaired people's lives much easier, as it will help them in recognizing objects. Another aim is to identify texts on objects. An additional feature for the device is to make the device capable of recognizing different colors. This device is easy to use, and it can be used by users of different ages. There are two main parts for our project: software part and hardware part. Hardware part will contain camera, Ultrasonic sensor, Bluetooth headset, Raspberry Pi and power bank. While the software part will be OpenCV as the framework, that uses Python as the programming language. We also use a deep learning technique. This technique is a type of machine learning methods that uses neural network architectures to extract features from an image in order to recognize the object exists in the captured image.

**Technology:** Machine Learning and Computer Vision

**Drawbacks:** No any specific forms of input specified for getting Image.

## **2. The architectural design of smart blind assistant using IoT with deep learning paradigm.**

**Authors:** Md. Wahidur Rahman, Saima, Siddique Tashfia, Rahabul Islam, Md. Mahmudul Hasan Sadee Ibn Sultan, Shisir Mia, Mohammad Motiur Rahman

**Year:** November 2020

**Aim:** To Develop a Blind Assistant performing various operations like object detection using External Sensors.

**Overview:** This section presents an architectural design of smart blind assistant with the mechanism of deep learning along with IoT. The research is included with a set of development process to get an optimum solution for a blind person. The research is classified into three significant parts. The first one is IoT based blind stick on ensuring the precise movement of a blind person with real-time observation via the cloud. The second one is deep learning approaches to detect objects around the surroundings of blind people. The third one is the architectural design of the virtual assistant, which acts as manager of this full integration. The blind stick includes the mechanism of IoT and smart cap utilizes deep learning paradigm whose are connected to the intelligent assistant via Bluetooth and Wi-Fi. This manuscript also presents experimental data analysis to show the effectiveness of the proposed method. This manuscript provides a System usability scale (SUS), which indicates the user's satisfaction with our developed architecture. The proposed model has found a SUS score of 86%. The limitation of this work is the model includes a limited number of sensors and devices. Another limitation is the model uses a pertained model in object detection with a limited number of real-world images because of the diversity in objects. In the future, this research will fix these two issues. Several types of sensors, such as the MQ gas sensor, the flame sensor will be

added and the scheme trained with an extensive image dataset in object detection to ensure a more optimum solution. However, the proposed model will be effective in the daily activities of a blind person.

**Technology:** Deep Learning, IOT

**Drawbacks:** Too much of external sensors is involved which is not blind user friendly.

### **3. Digital assistant for the blind**

**Authors:** Prince Bose, Apurva Malphak, Utkarsh Bansal, Ashish Harsola

**Year:** December 2017

**Aim:** To Develop a Voice Assistant for Blind Users.

**Overview:** The blind and the visually impaired have little to no internet presence because of the absence of cheap solutions to get them online which can be both, hardware and software. Existing technology used for enabling the blind or visually impaired to use the internet or any digital form of information is dependent on Braille displays and keyboards which are expensive and scarce. Hence a voice controlled system for the blind and the visually impaired was designed, which transceives information in the form of audio. It enables the user to receive and send emails, access daily news, weather forecast, set reminders and alarms and make notes.

**Technology:** Speech Recognition System

**Drawbacks:** Only Voice Input is specified citing Braille Keyboard is expensive.

## **4. Smart Assistant Device for Blind and Visually Impaired**

**Authors:** Talal Bonny

**Year:** May 2019

**Aim:** Aim is to facilitate blind and visually impaired people's lives and improve their self-esteem.

**Overview:** The Smart Assistant Device is a cost-effective system that is able to recognize objects, colors and text written on objects in an efficient and simple way. The system consists of Raspberry Pi, camera, Ultrasonic sensor, bone conduction headset, push buttons and a power bank. The user will have the freedom to choose which algorithm to run through 3 push button and a fourth push button to measure the distance between the object and the camera for better recognition.

**Technology:** Deep Neural Networks

**Drawbacks:** No clear form of Input is specified which leads to confusion.

## **CHAPTER 3**

### **SYSTEM ANALYSIS**

#### **3.1 EXISTING SYSTEM**

Virtual Assistants or Chatbots will play an important role in our day-to-day life according to many AI experts. Existing Chatbots like Google Assistant, Siri and Alexa have been equipped with all sorts of functionality that assist a normal human. We can easily interact with these chatbots and perform operations like setting notifications, booking appointments, making call or playing a song. However, the input we supply to these are either through voice recognition which activates on a button click or through a normal QWERTY keyboard. This clearly shows that these chatbots are designed for fit and abled persons. Blind Persons who are around 50 million in population find it difficult to be dependent on another human for their day-to-day activities and are largely dependent on assistants or chatbots.

However, the current assistants are need to be optimized for a Blind user as the current input taking methodologies are not blind user friendly. Braille Keyboard can be used instead of QWERTY Keyboards for Blind Users alone. TalkBack Functionality which allows the chatbot to speak what is on the screen is present in Google Assistant Only. The assistants even lack service for storing user medical details and use them for booking doctor appointments.

The Conclusion is these modern-day assistants are great and bring a huge set of functionalities for a normal man use, but struggle to replicate the same for a Blind User.

##### **3.1.1 DISADVANTAGE**

- Braille Keyboard is not implemented as input in many chatbots.
- Talkback system is absent from all assistant apart from Google Assistant.
- No Specific Storage System for storing user's medical records and booking doctor appointment.
- No Blind User-Friendly Interface.



## 3.2 PROPOSED SYSTEM

The Proposed System is BMA (Blind Men's Assistant) a chatbot named Helen specially created for Blind Users. At First the users have been asked to signup where the users' medical data is stored securely and used for doctor booking appointment process.

The BMA has two forms of input for interacting with blind users. One is normal Speech Recognition API from Google through which user can interact with the queries with chatbot. This speech recognition is automatically loaded on Application start and recognize speech until voice output is produced by the user. The Second and the most important form of input is Braille Keyboard. User input their query through the six buttons which represents the six dots of a braille keyboard. After user completes pressing the button the chatbot compares the user values with the braille pattern and returns the matching value.

After getting the input chatbot try to understand the keywords and try to find the matching keywords from the inputs. Once the Chatbots gets the Matching Keywords it executes the functions of those keywords. For Ex- If the Chatbot Receives the Keyword to find nearby Restaurants it Understands and find the nearby Restaurants from the user's location. BMA also has talkback system which means the chatbot speaks what is on the screen for the better knowledge of blind user.

Overall, the BMA could perform following important functionalities for Blind User: -

- Booking Doctor Appointments
- Getting OCR Text
- Making Phone Calls
- Locating Nearby Places
- Getting Info about Topics

### **3.2.1 ADVANTAGES**

- Implementation of Braille Keyboard as an Input.
- Implementation of Talkback System.
- Ability to store user's medical data and use them for booking doctor appointment.
- Ability to get nearby places within user's location.
- Other Functionalities like OCR, General info etc.

### **3.3 FEASIBILITY STUDY**

Depending on the results of the initial investigation the survey is now expanded to a more detailed feasibility study. "FEASIBILITY STUDY" is a test of system proposal according to its workability, impact of the organization, ability to meet needs and effective use of the resources. It focuses on these major questions:

- What are the user's demonstrable needs and how does a candidate system meet them?
- What resources are available for given candidate system?
- What are the likely impacts of the candidate system on the organization?
- Whether it is worth to solve the problem?

During feasibility analysis for this project, following primary areas of interest are to be considered. Investigation and generating ideas about a new system does this.

So, in the proposed scheme the implementation has been presented to two blind man named Mr. Siva and Mr. Rahul and all the information are recorded.

#### **3.3.1 ECONOMICAL FEASIBILITY**

Economic justification is generally the "Bottom Line" consideration for most systems. Economic justification includes a broad range of concerns that includes cost benefit analysis. In this we weight the cost and the benefits associated with the candidate system and if it suits the basic purpose of the organization, the project is making to the analysis and design phase. The financial and the economic questions during the preliminary investigation are verified to estimate the following:

- The cost to conduct a full system investigation.
- The cost of hardware and software for the class of application being considered.
- The benefits in the form of reduced cost.
- The proposed system will give the minute information, as a result the performance is improved.
- This feasibility checks whether the system can be developed with the available funds (i.e., funds which is feasible for a normal blind user can afford). The Blind Man's Assistant System does not require enormous amount of money to be developed. This can be done economically if planned judiciously, so it is economically feasible. The cost of project depends upon the number of man hours required and server space.
- This can be done by estimating user volume and buying the server space accordingly, regarding the Doctor Fees a nominal fee may be charged.

### **3.3.2 OPERATIONAL FEASIBILITY**

It is mainly related to human organizations and political aspects. The points to be considered are:

- What changes will be brought with the system?
- What organization structures are disturbed?
- What new skills will be required? Do the existing staff members have these skills? If not, can they be trained in due course of time?

The system is operationally feasible as it very easy for the End users (Blind users) to operate it. It only needs basic information about Website platform.

### **3.3.3 TECHNICAL FEASIBILITY**

A study of resource availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology needed for the proposed system is available or not.

- Can the work for the project be done with current equipment existing software technology & available personal?
- Can the system be upgraded if developed?
- If new technology is needed then what can be developed? So by using the proposed scheme i.e.: "BMA" we can clearly confirm there is huge scope for future updates as this piece of software is a normal website which can be easily upgraded through server.

### 3.4 PROJECT PLAN

S.No.	PROJECT MODULES	PROJECT COMPLETION PERIOD
1	Collecting Base Paper	1 <sup>st</sup> Week of March 2021
2	Studying The Base Paper And Proposed Features	2 <sup>nd</sup> Week of March 2021
3	Collecting the Datasets and Needed Information	3 <sup>rd</sup> and 4 <sup>th</sup> Week of March 2021
4	Implementation Works	1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> week of April 2021
5	Project Completion and Further Modification	4 <sup>th</sup> Week of April 2021
6	Preparation of Report	1 <sup>st</sup> Week of May 2021

### 3.5 BUDGET PLAN

Requirements	Total (in Rs)
Server Price	7000
Database charges	5000
Project Development Cost (Collection of raw data)	1500
<b>Total Expected Budget ₹</b>	<b>₹ 13,500</b> <b>(Thirteen Thousand and five Hundred only)</b>

## CHAPTER 4

### SYSTEM SPECIFICATION

#### 4.1 HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design

- Processor : Processor with Base Power of 1.3Ghz
- RAM : 4GB
- Hard disk : 500 GB
- Compact Disk : 650 Mb
- Keyboard : Standard keyboard
- Mouse : Logitech mouse
- Monitor : 15 inch color monitor

## **4.2 SOFTWARE REQUIREMENTS**

The software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is useful in estimating cost, planning team activities and performing tasks throughout the development activity.

- Operating system : Windows OS ( XP, 2007, 2008) or Linux or Mac
- Front End : HTML, CSS, JavaScript
- IDE for JAVA : Microsoft Visual Studio Code
- Back End : PHP (Version 8), Python (Above Version 3), MYSQL(Version 8)
- Server : Apache
- IDE for MYSQL : XAMPP Control Panel 3.2.4

## **CHAPTER 5**

### **SOFTWARE REQUIREMENT SPECIFICATION**

#### **5.1 INTRODUCTION**

A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. These chatbots or Assistants can be used in performing tasks such as booking appointment, setting alarm, sending message etc. These chatbots work by taking human voice or text from QWERTY keyboard as input.

However, a chatbot like these is not Blind User Friendly. Blind People are those who lost their eye sight and not familiar with normal keyboards Humans use. The blind people are more familiar Braille Keyboard as it is made with braille pattern which consists of only 6 keys.

The main aim of BMA is introducing Braille Keyboard as Input for the Blind People which makes the chatbot blind-user friendly. Any form of query which the user has can be sent as an input through the 6 buttons.

When the User completes pressing the key/buttons then the chatbot matches the user pattern with the braille pattern and understands its output and print/speak the output. For Ex if user types 123 as input the chatbot understands L as output and prints it.

This input is further used by chatbot to understand the query the user asks and perform the function and print the output accordingly. Through this way a blind user specific chatbot BMA is Designed. These chatbots should also have the capability to store user medical information which can be used to book doctor appointments.

## **5.2 FUNCTIONAL REQUIREMET**

- **Signup (Get Users Medical Data)**

This is the first module for the chatbot. Users are asked to sign up first where their medical data are fetched and stored securely in MYSQL database. These data are used while booking Doctor Appointment.

- **Braille Keyboard**

This module is mainly designed for blind user convenience. The Keyboard consists of six keys and button to confirm the character. Whenever user completes pressing and presses the confirm button the chatbot tries to match the input pattern with braille pattern and returns the output. There is also a separate key to switch between Alphabets and Numbers.

- **Speech Recognition**

Speech Recognition should be part of another input from user to increase convenience. The speech recognition should be sharp and automated so that it only stops listening if the user stops speaking.

- **Doctor Booking**

Whenever the blind user wants to book a doctor appointment, he/she can approach chatbot and the chatbot assigns the doctor based on the availability. The medical details of the user can be sent to the Doctor.

- **OCR**

Optical Character Recognition is used by the blind users to recognize text in the book, sheet they have. Users could simply take a photo and send it to the chatbot which further uses Tesseract JS Library to extract OCR from the image and speak it to the user.

- **Nearby Places Location**

User can get nearby places like hospitals or hotels just by prompting to a chatbot. The chatbot then gets the user's location through IP Address and then displays the nearby places by concatenating user's latitude and longitude along with the place user want to find in Google Map's URL.

- **Call**

The chatbot could make call to a number if the user wants to.

- **General Info**

The Chatbot should be able to get general info on topics which the user prompts. This info should be genuine and should be loaded from genuine sites like google, Wikipedia.

- **TalkBack**

This module is designed to denote user what is present on the screen. The chatbot should be able to speak what is on the screen based on user's click.



## **5.2.1 MODULES**

### **1. Signup / Login**

- Get User's Medical Data.
- Encrypt it using AES-256-bit Algorithm.
- Store it in MYSQL database.
- Decrypt and Retrieve the details if the user wants to login and check it.
- Review

### **2. Braille Keyboard**

- Get Input from Six Keys.
- Can Change from Alphabets to Numbers and Vice Versa.
- Get the Letter Typed based on matching the input with Braille Pattern.
- Submit the Query

### **3. Speech Recognition**

- Listen until user speaks.
- Print.

### **4. Doctor Booking Module.**

- Check if the user has logged in.
- Login if not logged in.
- Find the Available doctor and inform the user.
- Send the patient/user details to the doctor.
- Payment

### **5. Other Functionalities**

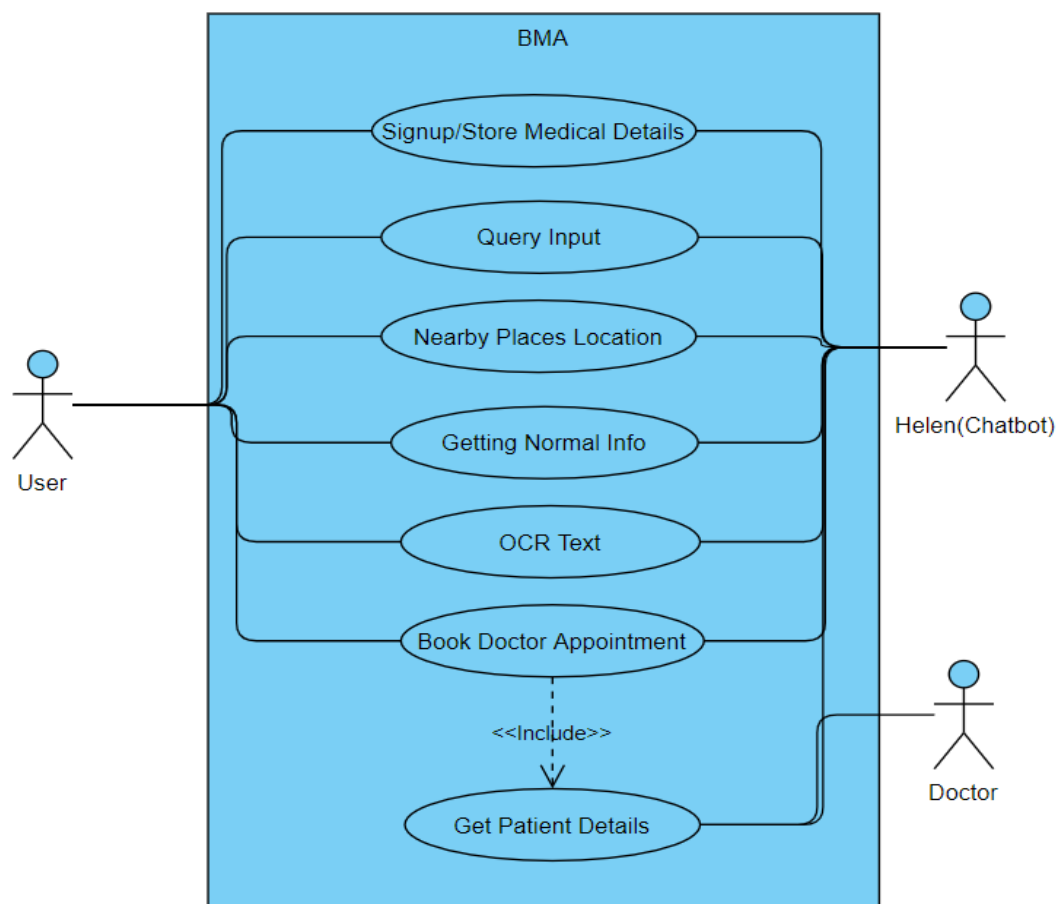
- OCR Text Recognize
- Get Nearby Places on Maps

- Get General Info
- Make Calls

### 5.3 USECASE DIAGRAM

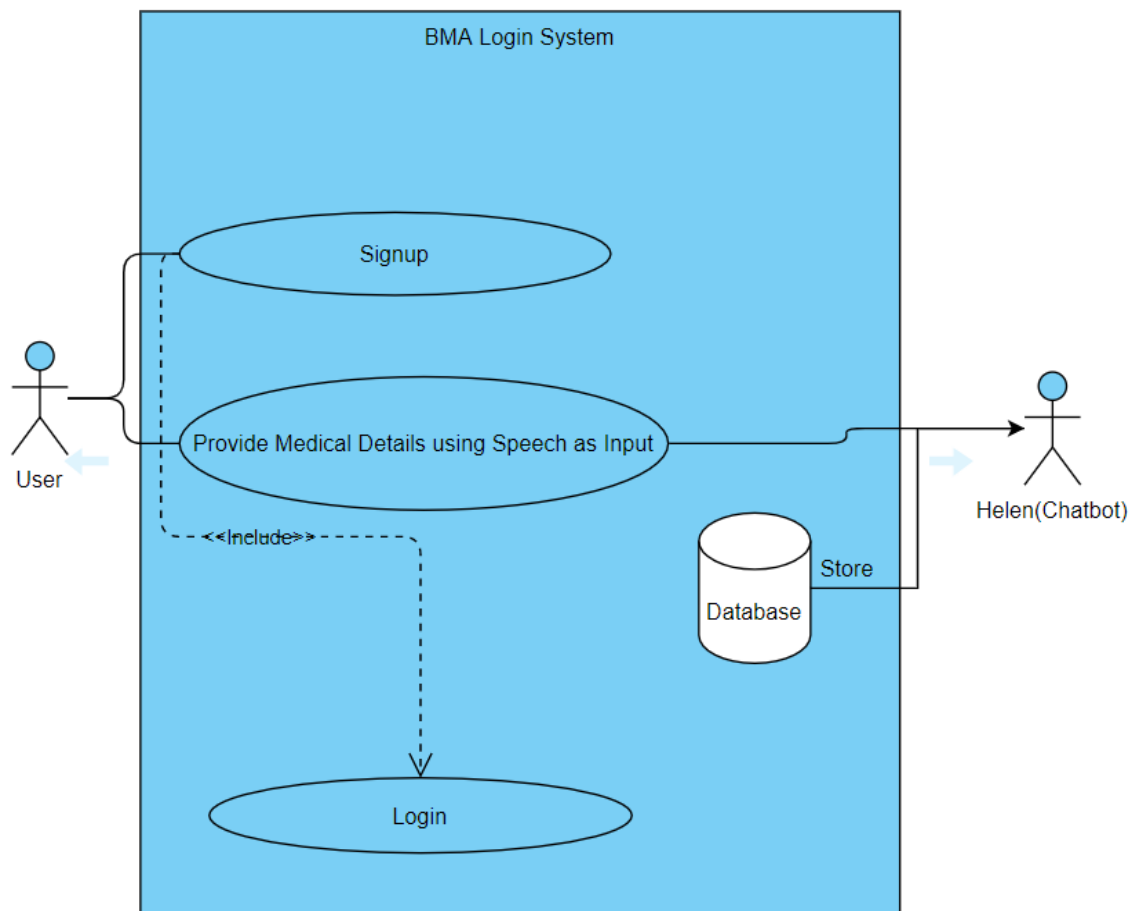
Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors).

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.



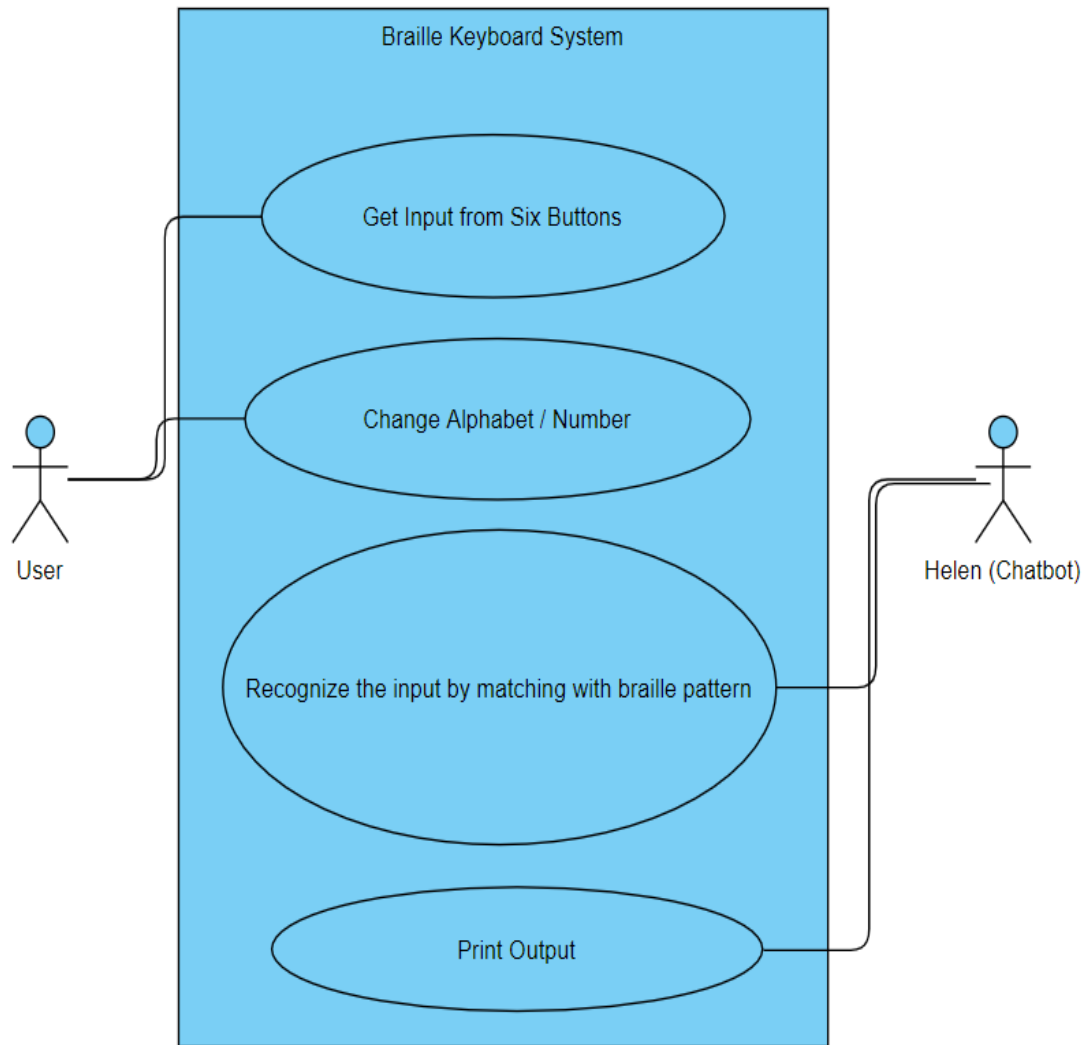
**Fig 5.3: Usecase diagram**

### 5.3.1 USECASE FOR LOGIN SYSTEM



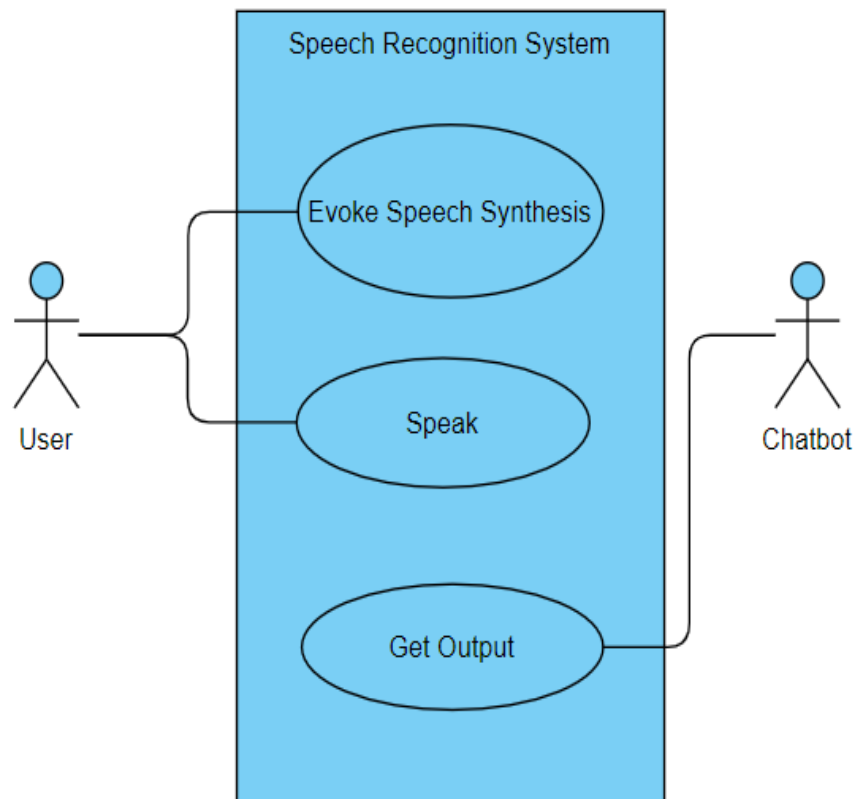
**Fig :5.3.1: Use case for login system**

### 5.3.2 USECASE FOR BRAILLE KEYBOARD



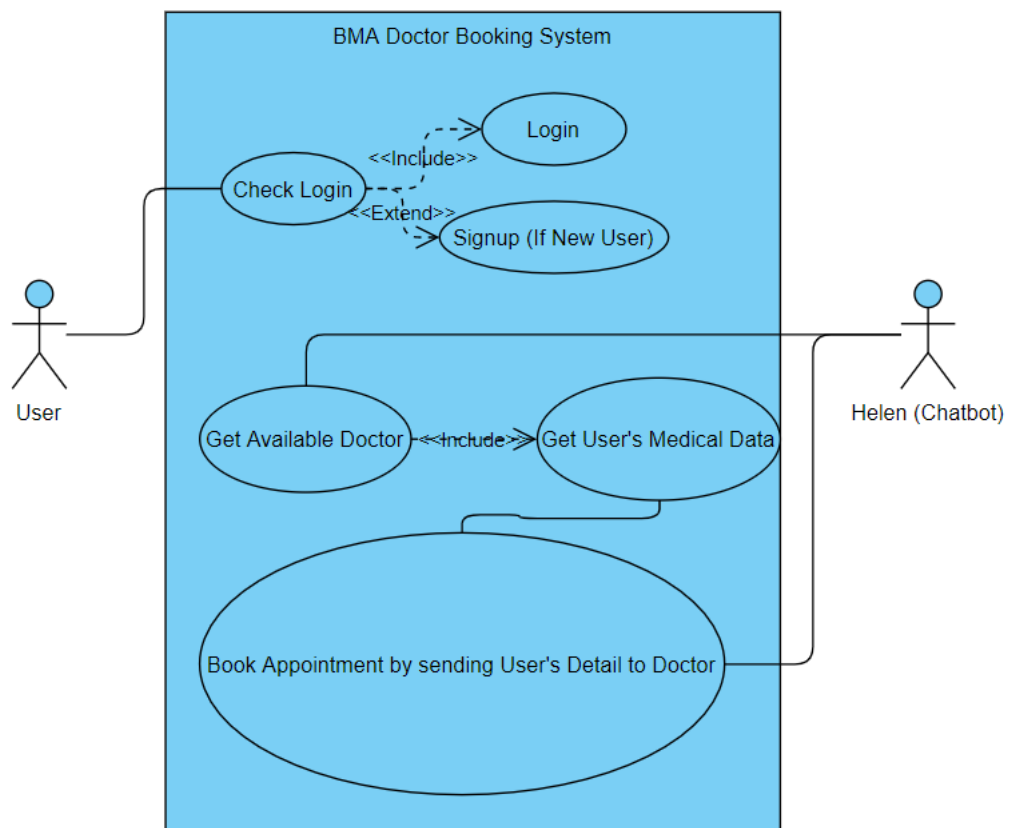
**Fig 5.3.2: Use case for braille keyboard**

### 5.3.3 USECASE FOR SPEECH RECOGNITION SYSTEM



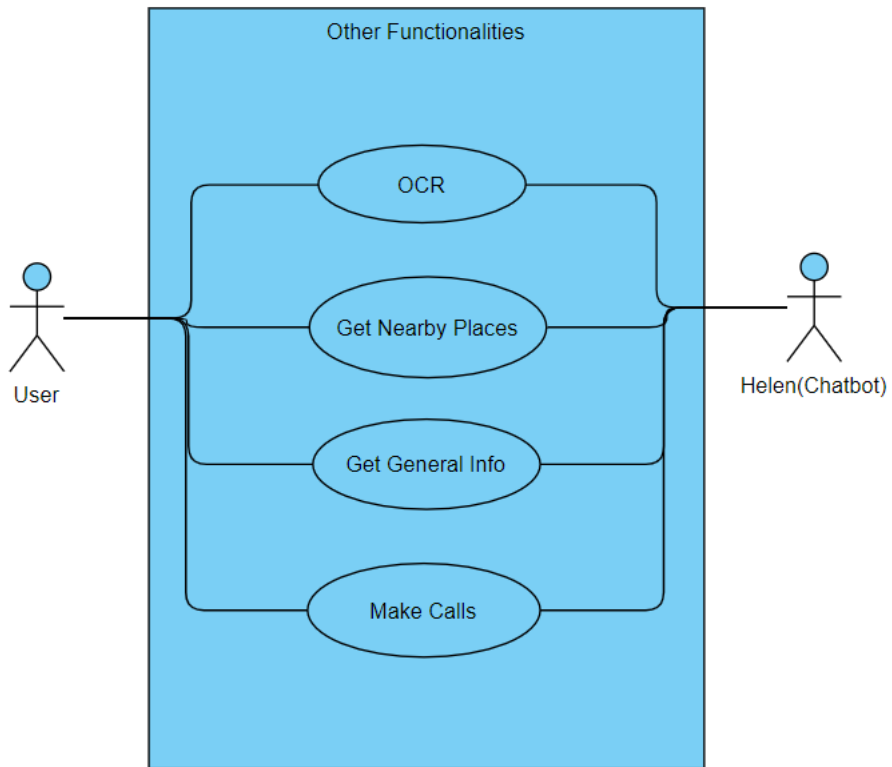
**Fig 5.3.3: Use case for speech recognition system**

### 5.3.4 USECASE FOR Doctor Appointment System



**Fig 5.3.4: Use case for Doctor Appointment System**

### 5.3.5 USECASE FOR Other Functionalities



**Fig 5.3.5: Use case for Other Functionalities**

## **5.4 NON-FUNCTIONAL REQUIREMENT**

### **RELIABILITY**

This quality attribute specifies how likely the system or its element would run without a failure for a given period of time under predefined conditions.

### **MAINTAINABILITY**

Maintainability defines the time required for a solution or its component to be fixed, changed to increase performance or other qualities, or adapted to a changing environment.

### **AVAILABILITY**

Availability describes how likely the system is accessible for a user at a given point in time.

### **PORTABILITY**

Portability defines how a system or its element can be launched on one environment or another. It usually includes hardware, software, or other usage platform specification.

### **PERFORMANCE**

Performance defines how fast a software system or its particular piece responds to certain users' actions under certain workload.

### **SCALABILITY**

Scalability assesses the highest workloads under which the system will still meet the performance requirements.

### **SECURITY**

Security ensures the privacy of the BMA user. The Medical data which are gathered first is encrypted using AES-256-bit Algorithm and stored.



## 5.5 USER INTERFACE REQUIREMENT

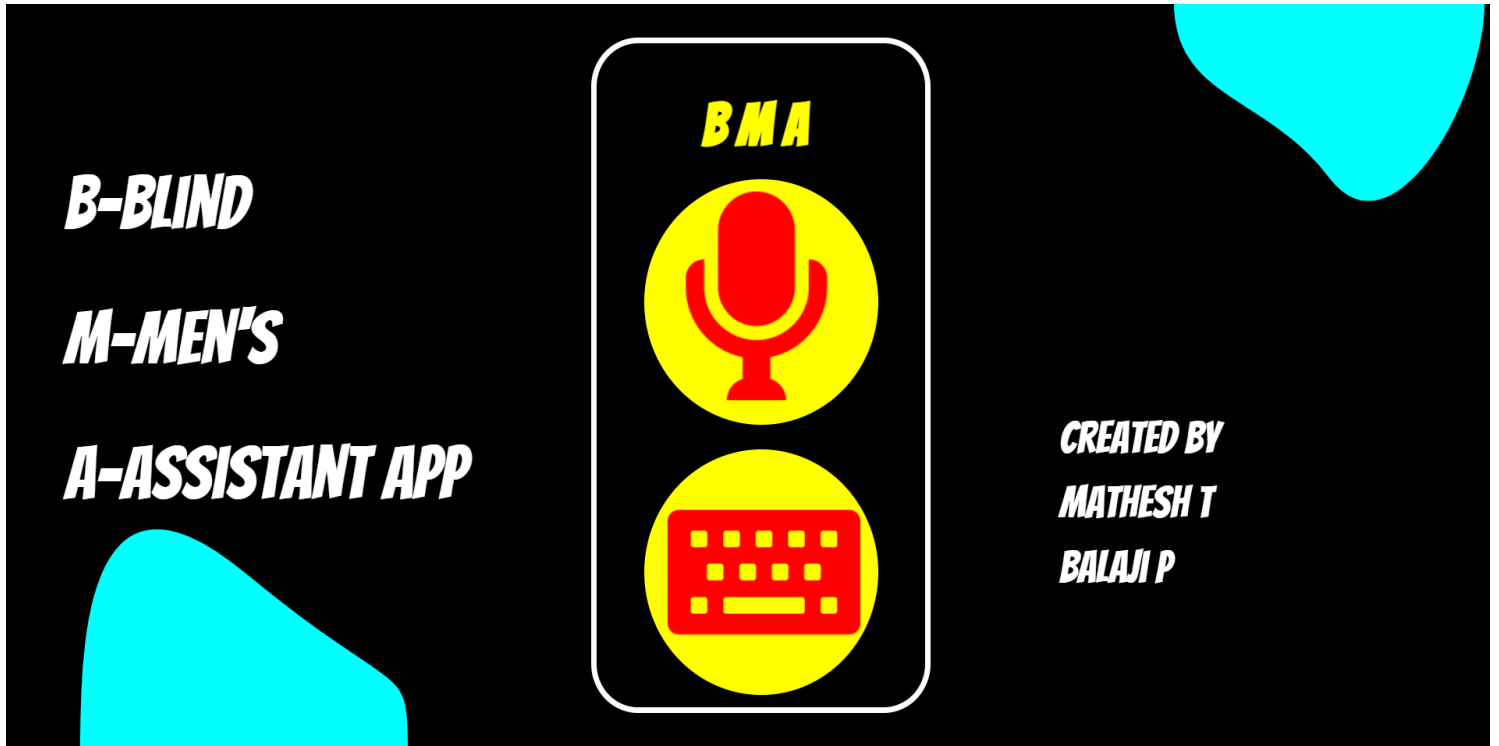


Fig 5.5.1: Index Page Design

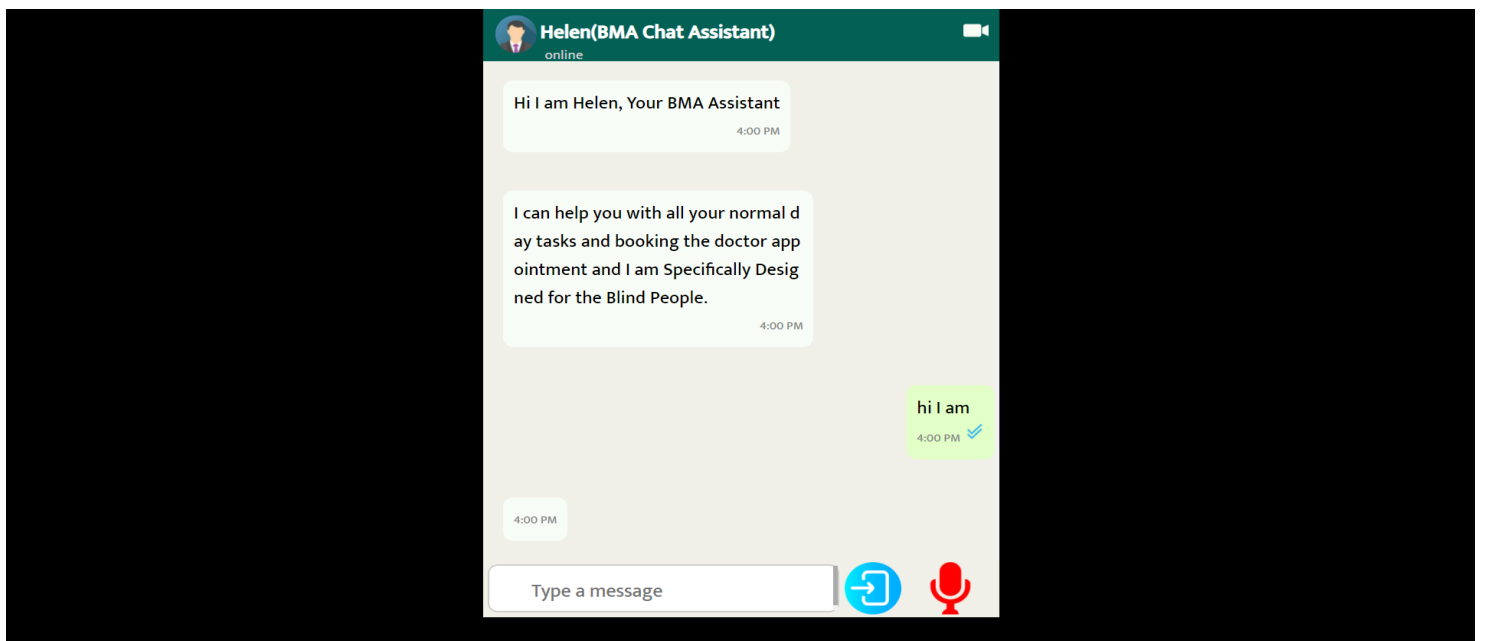


Fig 5.5.2: Speech Design



Fig 5.5.3 :Braille Keyboard Input Design

## BMA - BLIND MEN'S ASSISTANT APP

EXAMPLE EMAIL ID

EXAMPLE PASSWORD

EXPLAIN THE CAUSES OF YOUR IMPAIRMENT

Cause of your Impairment

SELECT YOUR BLOOD GROUP

Your Blood Group

WHAT KIND OF VISION IMPAIRMENT DO YOU HAVE?

Your Vision Impairment

EXAMPLE YOUR ADDRESS

Submit

CREATED BY MATHESH T AND BALAJI P

Fig 5.5.4: Login Screen Design

## **CHAPTER 6**

### **SOFTWARE DESIGN**

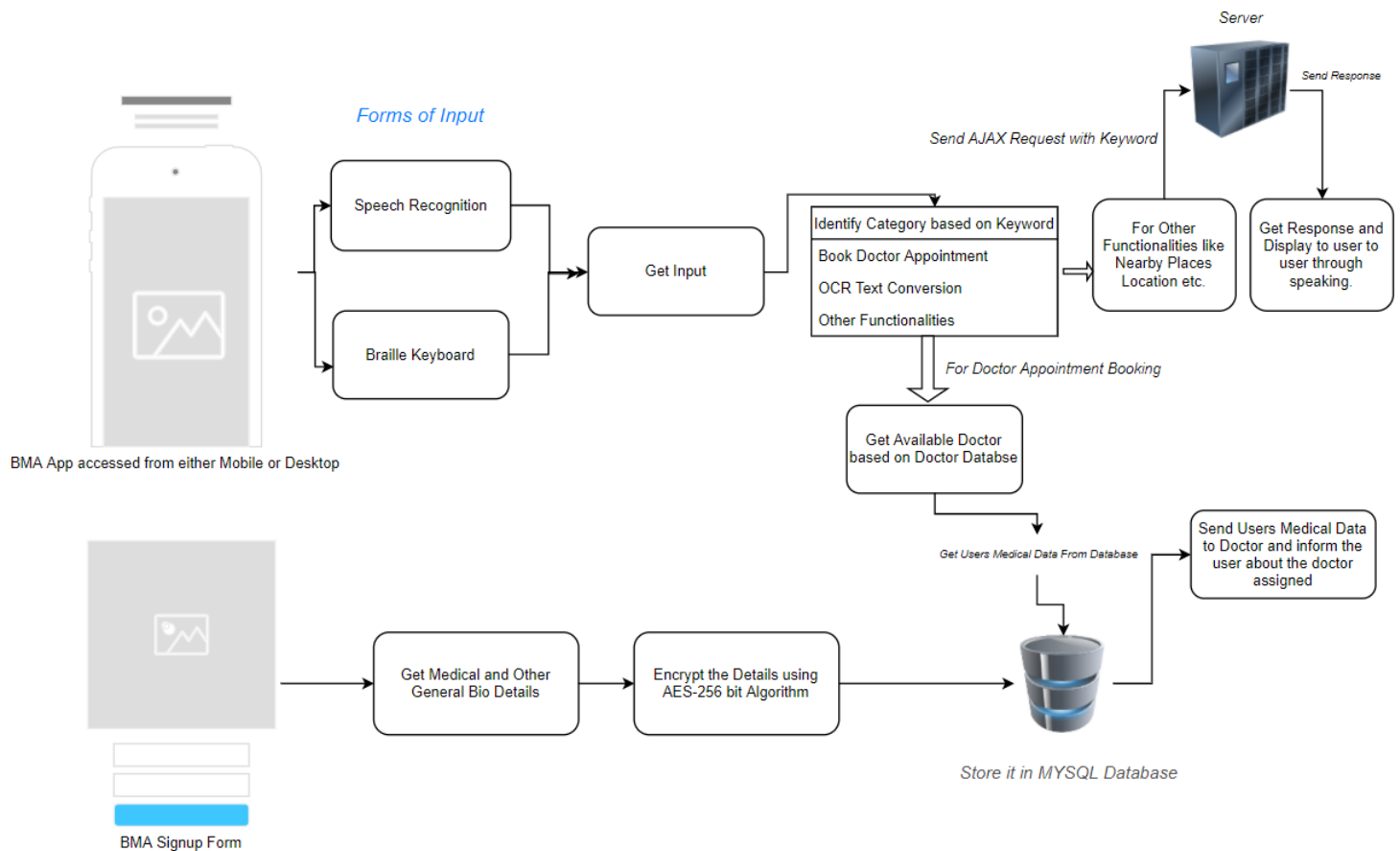
#### **6.1 OVERVIEW OF THE PROJECT**

BMA is a chatbot / virtual assistant specially designed for Blind Users. BMA's chatbot Helen accepts two types of input from user. One is the normal Speech Recognition and other is a dedicated Braille Keyboard which comes with the software. Braille Keyboard works by storing user input in local storage and by marching the input with braille patterns. The BMA system first intakes the user's medical report and general bio info and store it in the database securely.

The user could then interact with Helen to get answers to their queries. Helen could perform following functions: -

- Book Doctor Appointments
- Get Nearby Places Location
- Make Calls
- Get General Info
- OCR Text Conversion

The above functions are performed by separating the keyword from Input and comparing it with a categorical Decision Tree where all the function names are categorized, and the comparison is done through Reg Expression. When the user wants to book the doctor appointment the medical details of the user which has been previously stored is sent to the desired doctor. Other functionalities like OCR text conversion, Get Nearby Places location works by sending an AJAX request to server with keywords where the server files execute the operation based on keyword and send the response to the client.



**Fig 6.1: Architecture diagram of BMA System**



**Fig 6.2: ER diagram for BMA Doctor Booking System**



## **4. Doctor Booking Appointment**

Users of BMA system can book doctor appointments easily through the Helen Chatbot. The Chatbot checks if the user has signed in and assigns the doctor available from the doctor database by sending user's medical details to the doctor.

## **5. Get General Info**

When user wants to know info about general topics like covid, India etc., the chatbot sends an AJAX request to the server. The Server then separates the keyword and search the results in top sites like Wikipedia and retrieves the top 2 lines from the result and sends the output as a response to the client. The Client (chatbot) speaks the output to the user.

## **6.OCR**

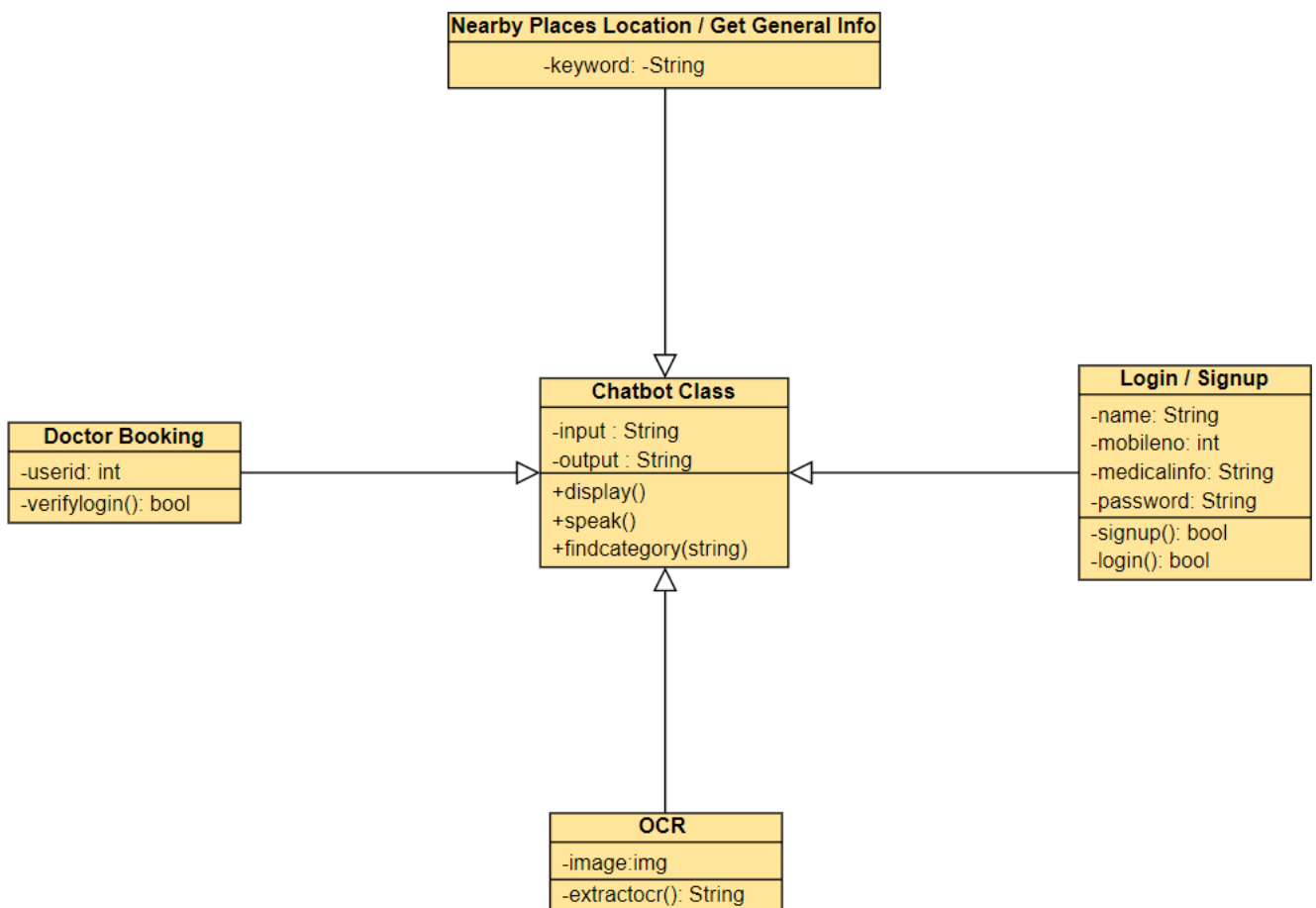
OCR Text conversion is used when user wants to know what is the text on the book, he/she is reading. This Module works by Tesseract library. The Image captured by user is sent to tesseract library which extracts the OCR text and displays it to the user.

## **7.Get Nearby Places Location**

Users can get the nearby places like hospitals, hotels etc. through Map location from Chatbot. This works by getting the place user wants to locate from the input and send it to the server using AJAX request. The Server then gets the location of the user through IP Address. This Location (Latitude and Longitude) is matched with the URL of the GOOGLE MAPS along with the search string (Place) and return it to client as response.

## 6.4 CLASS DIAGRAM

The class diagram is the main building block of object-oriented modeling. It is used for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. In the diagram, classes are represented with boxes that contain three compartments: The top compartment contains the name of the class. It is printed in bold and centered, and the first letter is capitalized. The second compartment is attributes along with access specifiers. The third compartment is methods along with return values and access specifiers.

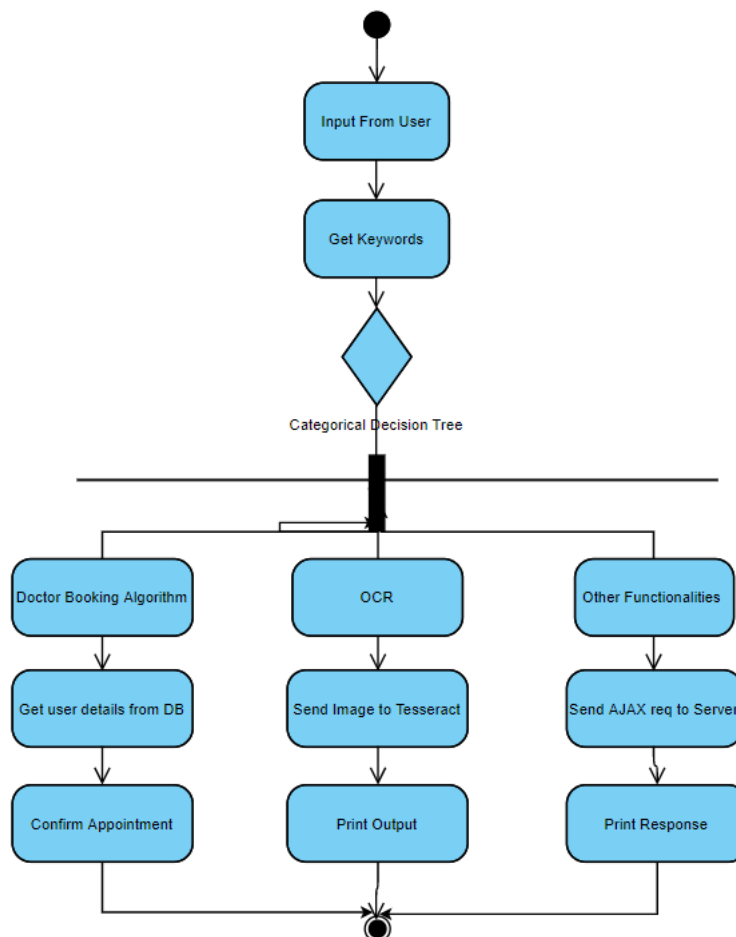


**Fig 6.4: Class diagram of BMA**

## 6.5 ACTIVITY DIAGRAM

An activity diagram visually presents a series of actions or flow of control in a system similar to a flowchart or a data flow diagram. Activity diagrams are often used in business process modeling. They can also describe the steps in a use case diagram. Activities modeled can be sequential and concurrent.

**The Purpose of Activity Diagram:** The basic purposes of activity diagram are similar to other four diagrams. It captures the dynamic behavior of the system. Other four diagrams are used to show the message flow from one object to another but activity diagram is used to show message flow from one activity to another. Activity diagrams are constructed from a limited number of shapes, connected with arrows.

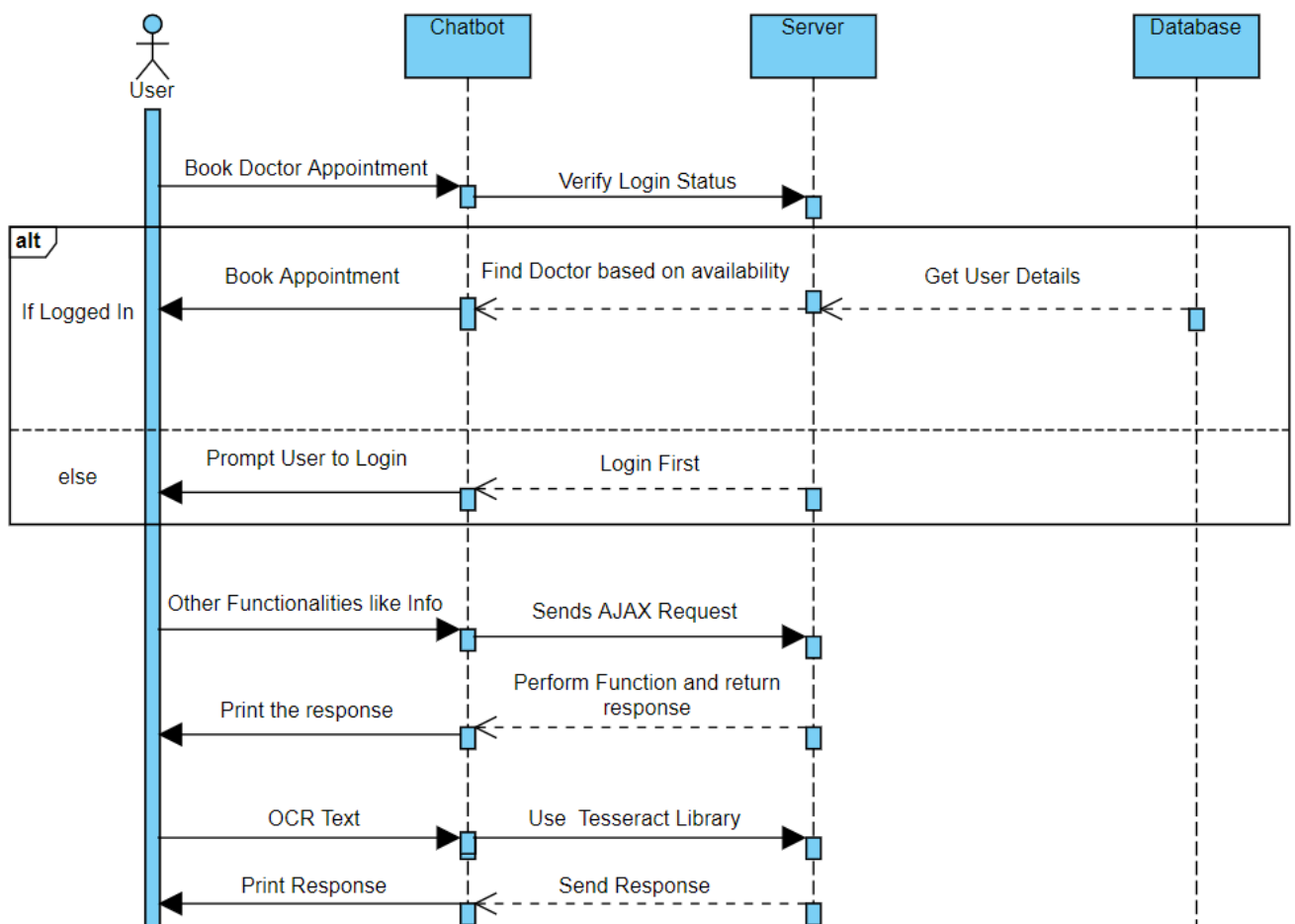


**Fig 6.5: Activity Diagram**



## 6.6 SEQUENCE DIAGRAM

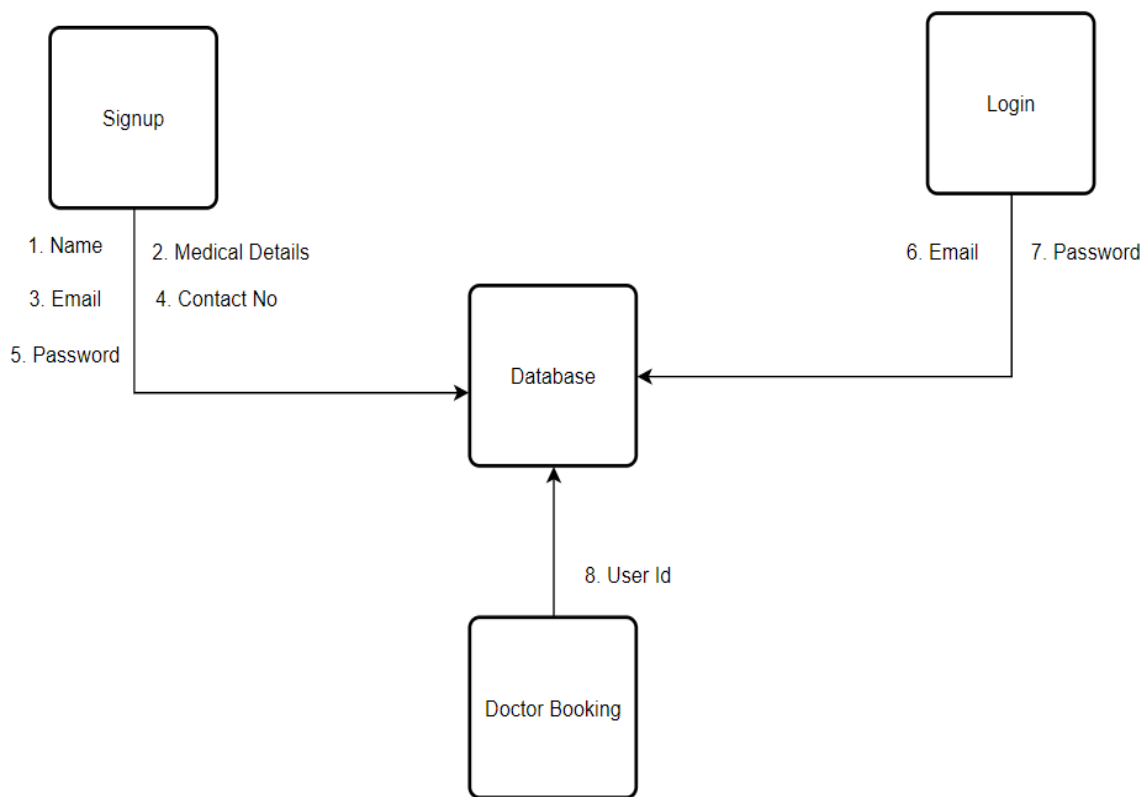
The sequence diagram is a good diagram to use to document a system's requirements and to flush out a system's design. The reason the sequence diagram is so useful is because it shows the interaction logic between the objects in the system in the time order that the interactions take place.



**Fig 6.6: Sequence diagram**

## 6.7 COLLABORATION DIAGRAM

A collaboration diagram, also called a communication diagram or interaction diagram, is an illustration of the relationships and interactions among software objects in the Unified Modeling Language (UML). UML Collaboration diagrams illustrate the relationship and interaction between software objects.



**Fig 6.7: Collaboration diagram**

## 6.8 INPUT DESIGN

### 6.8.1 Login Page:

User Email:	<input type="text"/>
Password:	<input type="password"/>
	<input type="button" value="LOGIN"/>

**fig 6.8.1: Input design for login page**

### 6.8.2 Register:

Name	<input type="text"/>
Address	<input type="text"/>
Contact No.	<input type="text"/>
Email ID	<input type="text"/>
Blood Group	<input type="text"/>
Cause of Impairment	<input type="text"/>
Other Medical Details	<input type="text"/>
	<input type="button" value="Register"/>

**Fig 6.8.2: Input design for register page**

## 6.9 OUTPUT DESIGN

User Id	User Bio	Medical Details	Password	Mail ID

**Fig 6.9: Output design**

## CHAPTER 7

### IMPLEMENTATION

#### 7.1 PSUEDO CODE 1

##### Braille Keyboard

**Input:** K is the key value of the 6 buttons entered

KS – Key shift from Alphabet to Numeric and vice versa

KC – Key Confirm

1 Get the **Input** from the user

2 Store the value in **local storage**

3 Keep the default key as alphabet

4 **IF** KS is pressed

5     Get the current pattern (Alphabet or Numeric)

6     **Change** the pattern to Alphabet if previous pattern is Numeric or vice versa.

7 **endif**

```

8 IF KC is pressed
9   |   Get the pattern from Local Storage
10  |   Compare the pattern with braille pattern
11  |   Find the matching pattern and return the output character
12 endif
13 else
14  |   Return Whitespace
15 end

```

## 7.2 PSUEDOCODE 2

### Doctor Booking Algorithm

**Input:** Keyword of Doctor booking from user

```

1 Send an AJAX Post Request to the server
2 IF user has signed in then
3   |   Get Available Doctor from the Doctor Database.
4   |   Retrieve user's details from the Database
5   |   Inform the user about the doctor and his details
6   |   Send the user's medical details as SMS to the doctor.
7 endif

```

```
8  else
9      |   Prompt User to Login
10     |   Repeat Steps 2-7
11 end
```

### 7.3 PSUEDOCODE 3

**Other Functionalities like Getting general info, nearby places location.**

**Input:** Keyword from user

```
1  Convert the input from user to lowercase
2  Compare the Keyword with predefined categories using Reg Expression
3  Find the Matching Category
4  Send AJAX Post Request to the server along with the category and keyword
5  Perform Necessary Operation using desired libraries
6  Send the output as response
7  Get the Response from the server
8  Print (Speak) the Response to the user
9  end
```

## **CHAPTER 8**

### **SOFTWARE TESTING**

#### **8.1 INTRODUCTION**

As per WHO records, at present in our world nearly 280 million people are impaired of whom 39 million people are blind. The biggest challenge for a blind person, especially the one with the complete loss of vision, is to navigate around places. These people have to be dependent on a normal Individual for performing day to day activities.

AI Assistants like Google Assistant, Alexa, Siri have hugely lived up to the task of helping normal person's day to day task. But these assistants fail to live up to the task replicating the same work with Blind or Disabled People. The way these assistants are designed like taking input, performing user specific actions are all been made keeping a fit and abled person as Target user.

To Overcome the above challenges and problems, BMA (Blind Men's Assistant) System is proposed in this study to achieve the following: -

- 1) To give the Blind Person specific Input by Implementing Braille Keyboard.
- 2) To gather user's medical data in first place and help them in booking Doctor Appointments.
- 3) To Assist blind user's day to day task like navigation of nearest places, getting ocr text from a book, knowing about some specific topics all through braille keyboard or voice as input.

The above function is designed mainly keeping a Blind Person as a target user and also ensuring their security of medical data's. Therefore, the proposed model will ensure that blind men people will not have to feel dependent on others for some work and also resulting in use of better technologies for overcoming disabilities of people...

## 8.2 TESTCASE DESCRIPTION

### 8.2.1 TESTCASE DESIGN

Quality assurance is the review of the software product that checks for the Correctness, reliability, completeness, and maintainability. The different section under

Quality assurance are unit testing, integrated testing, validation testing, output testing, user acceptance testing.

Test cases gives an idea like on perform of some tasks what will be predicted output or result. It will help in predicted the result on perform of certain tasks. The test cases below gives an idea of what result must be obtained in performing a particular task.

#### **SIGNUP FORM**

The test cases involved are whether valid user bio and medical details are entered or invalid details are entered.

#### **EVENT FORM**

The test cases included are-on the click of Register button, Onload event, and exit button.

#### **AJAX REQUEST FORM**

The test cases included are the post requests made to Server asynchronously.

### 8.2.2 TESTCASES FOR MODULES

#### **Signup Form**

S. No	Test Case	Expected Result	Test Result
1.	Enter valid Bio details and medical info & click on signup Button	Software should display main window and store the details in database.	Successful
2.	Enter invalid	Software should raise an error	Successful



**Table 8.2.2.1: Signup form for testcase description**

**AJAX Request Form**

<b>S. No</b>	<b>Test Case</b>	<b>Expected Result</b>	<b>Test Result</b>
1.	Post an AJAX Request to the server.	Software should get the details separate and check the keyword and post a request to server.	Successful
2.	Get Response from Server	Software should get response from server and speak it.	Successful

**Table 8.2.2.2: AJAX Request form testcase description**

**Event form**

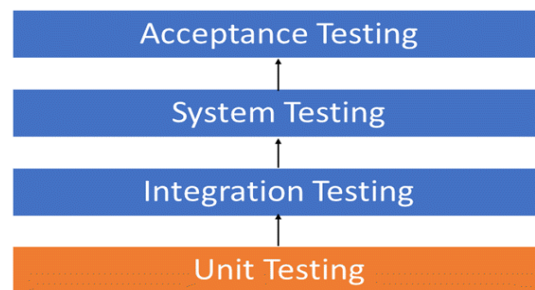
<b>S. No</b>	<b>Test Case</b>	<b>Expected Result</b>	<b>Test Result</b>
1	Start Speech Recognition.	Software page should start speech recognition on page reload.	Successful
2	Button checking	Software should implement onclick function on button click.	Successful
3	Enter the exit button if user wants.	Software should exit the page	Successful

**Table 8.2.2.3: Event form for testcase description**

## 8.3 UNIT TESTING

Unit testing is a software testing method by which individual units of source code, sets of one or more computer program modules together with associated control data, usage procedures, and operating procedures, are tested to determine whether they are fit for use.

Unit testing of software applications is done during the development (coding) of an application. Unit testing is a way of testing the smallest piece of code referred to as a unit that can be logically isolated in a system. It is mainly focused on the functional correctness of standalone modules. So, it is also micro-level of software testing.



**Fig 8.3: Unit testing**

## 8.4 INTEGRATION TESTING

Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. Integration testing is conducted to evaluate the compliance of a system or component with specified functional requirements.

It occurs after unit testing and before validation testing. The purpose of integration testing is to verify the functional, performance, and reliability between the modules that are integrated.

The Integration Strategies are Big-Bang Integration, Top-down Integration, Bottom-up Integration, Hybrid Integration.

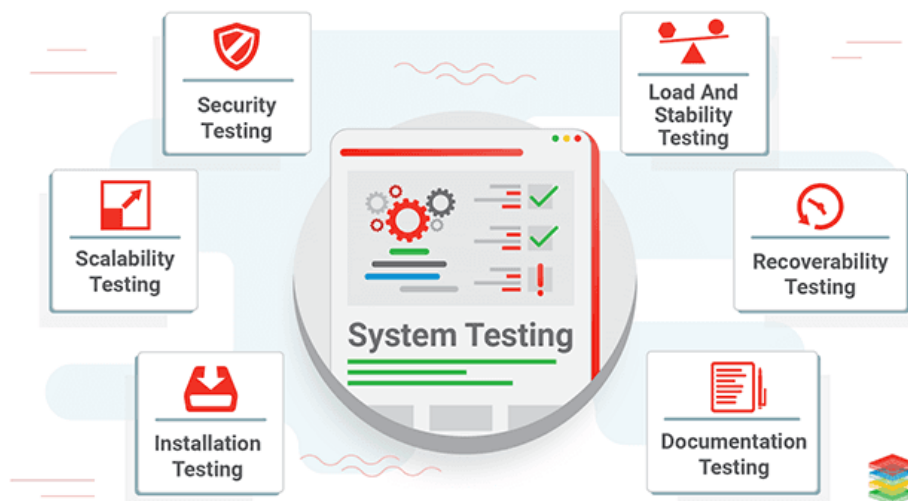


**Fig 8.4 :Integration testing**

## 8.5 SYSTEM TESTING

Software testing is a method of assessing the functionality of a software program. There are many different types of software testing but the two main categories are dynamic testing and static testing.

Dynamic testing is an assessment that is conducted while the program is executed; static testing, on the other hand, is an examination of the program's code and associated documentation. Dynamic and static methods are often used together.



**Fig 8.5 :System testing**

## CHAPTER 9

### RESULTS(SCREENSHOTS)

***BMA - BLIND MEN'S ASSISTANT APP***

**EXAMPLE EMAIL ID**

mati02official@gmail.com

**EXAMPLE PASSWORD**

\*\*\*\*\*

**EXPLAIN THE CAUSES OF YOUR IMPAIRMENT**

Corneal Opacity

**SELECT YOUR BLOOD GROUP**

AB+

**WHAT KIND OF VISION IMPAIRMENT DO YOU HAVE?**

Distance vision impairment

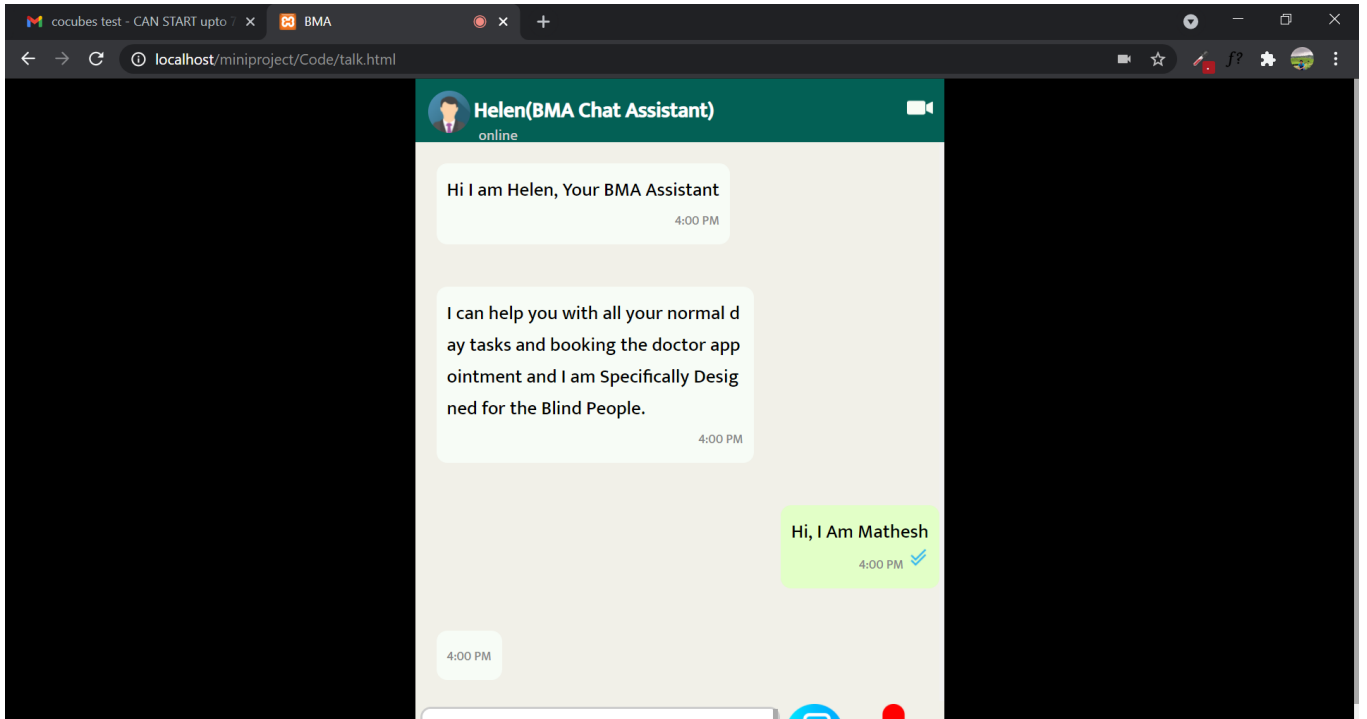
**EXAMPLE YOUR ADDRESS**

No 3/280, Andavar Flats  
3rd Main Road, Raghava Nagar, Madipakkam

Submit

***CREATED BY MATHESH T AND BALAJI P***

**Fig 9.1: Login Form Testing**



**Fig 9.2: Speech Recognition Event Test**



**Fig 9.3: AJAX Request Event Test**

## **CHAPTER 10**

### **CONCLUSION AND FUTURE ENHANCEMENT**

#### **10.1 CONCLUSION**

A Blind User Focused chatbot with various functionalities is proposed in this system. Some of the examples of blind user-friendly interface are implementation of Braille Keyboard, Talkback System, Bright Colored Interface and some necessary functionalities for blind people.

Blind People are in more need of assistance rather than a normal fit people as they depend on other people for every task. Through this system, we diminish differences on chatbots usage and give blind people a better day to day companion.

Apart from perfect blind user interface the system also ensures privacy of the user by encrypting the medical details of the user and perform various functionalities like Getting general info, nearby places location, making calls and generating OCR text.

Overall, we would like to conclude as per saying we need to technology to the fullest, so we need to use our modern-day technologies to bring equality and improve the human life. BMA tries to replicate the above scenario by giving the blind specific chatbot which would of very importance for the blind people.

#### **10.2 FUTURE ENHANCEMENT**

BMA has a lot more future scope like other chatbots. Since most of the functions are taking place in server changes can be made without modifying the front end. Going Forward some importance functions like NLP, Sentimental Analysis and Object Detection can be added as update to this chatbot which ensures better performance.

Hence as said BMA is not a finished system and can accommodate any future changes to pass the Turing test for chatbots.

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