SAVITRIBAI PHULE PUNE UNIVERSITY

A PRELIMINARY PROJECT REPORT ON

"BE MY EYES APP FOR BLIND PEOPLE"

Sem-I Report

Submitted by

Student Name Exam no.

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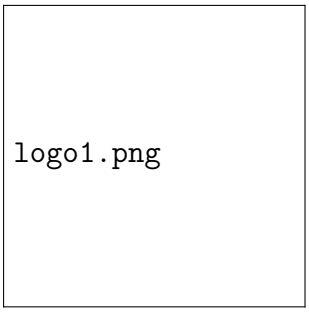
Under the guidance of

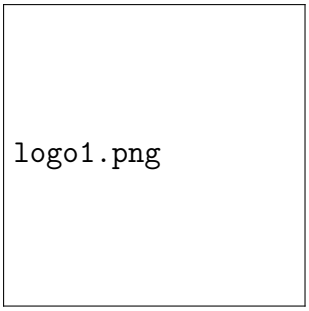
Prof.



DEPARTMENT OF COMPUTER ENGINEERING

College Name

[2023-24]



DEPARTMENT OF COMPUTER ENGINEERING

College Name

[2023-24]

CERTIFICATE

This is to certify that the Project Entitled

BE MY EYES APP FOR BLIND PEOPLE

Submitted by

Student Name	Exam No:———
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is a bonafide work carried out by Students under the supervision of Prof.———- and it is submitted towards the partial fulfillment of the requirement of Master of Engineering (———-) Project.

Guid Name Internal Guide Dept. of Computer Engg.	Prof.——— H.O.D Dept. of Computer Engg.
Prof.——— External Dept. of Computer Engg.	Prof.——— Principal Dept. of Computer Engg.

Abstract

A person's ability to see is one of their most crucial senses. Many people in this world, many millions of people, struggle with vision problems. These individuals struggle with communication and information access, making it challenging for them to navigate safely and independently. By alerting the blind to the items in their path, the proposed work aims to convert the visible world into an aural one. With the support of real-time object detection technology, this will enable persons with vision impairment to move autonomously and without the need for outside assistance. Through the use of image processing and machine learning, the programme can identify things in real time through the camera and communicate their location to blind users through voice output. Many problems have resulted from the inability to distinguish between items.

ACKNOWLEDGMENT

Please Write here Acknowledgment.Example given as

With immense pleasure, we are presenting this Project Report (stage-1) as a part of the curriculum of B.E Computer Engineering. We wish to thank all the people who gave us endless support right from the stage the idea was conceived.

We are heartily thankful to Prof. ..... (Project Guide) whose encouragement, guidance and support from the initial to the final level enabled us to develop an understanding of the subject. We would also like to thank Dr. Soumitra Das (HOD, Computer Engg. Department), Dr. Sunil D. Rathod (BE-Project Coordinator) and Dr. Sunil Ingole (Principal), for giving us opportunity to make project on this interesting topic.

This project would not be possible without help of library department who helped us gathering the information from various sources. Lastly, we offer our regards to all those who supported us in any respect during the completion of the stage-1 of our project.

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(B.E. Computer Engg.)

Contents

Chapter 1

Introduction

There are millions of people who experience vision impairment in one way or another. The ability to see is one of the major senses that is crucial for a person to lead a regular existence. Many blind people have significant mobility issues when moving around their surroundings. Due to this condition, the disabled person needs aid or instruction with every move. The everyday, professional, and social lives of those who are blind are quite challenging. The amazing ability of human eyesight to store billions of images in the brain and realise those images by comparing them to pre-images However, some people are still born without the gift of sight, and some have retinal disorders. Due to the widespread use and popularity of Android-based devices, the computer vision application is implemented on the Android platform. There are millions of people who experience vision impairment in one way or another. The ability to see is one of the major senses that is crucial for a person to lead a regular existence. Many blind people have significant mobility issues when moving around their surroundings. Due to this condition, the disabled person needs aid or instruction with every move. The everyday, professional, and social lives of those who are blind are quite challenging.The amazing ability of human eyesight to store billions of images in the brain and realise those images by comparing them to pre-images However, some people are still born without the gift of sight, and some have retinal disorders.Due to the widespread use and popularity of Android-based devices, the computer vision application is implemented on the Android platform. At the end of 2012, the Android mobile platform has a market share of smartphones, according to a Gartner survey. The programme is user-friendly and has speech syn- thesis capabilities so that the identified object can be spoken to blind individuals. The Technology for navigation of the blind is not sufficiently accessible, without vi- sion it can be challenging for visually impaired persons to navigate through rooms or different road paths . The main aim to develop the project is to help the visually im- paired people and to detect

the obstacles . The blind persons life become easier and without anyone helps they can walk alone through street they does not need anyone to assist them they can handle their self correctly.And also send sms, make a call, show date and time, battery status of phone,all these functionalites perform by this app by voice.

1.1 Motivation

"Be My Eyes" is an android application, which supports voice commands. The application is developed for visually impaired people. After unlocking the mobile phone the application will be launched without any voice command. The systems accept voice command and perform the operations according to it. For performing the further task it first translate the voice into text and then produces output in the form of voice.

1.2 Problem Statement

Blind people come across a number of challenges in everyday life from reading a book to walk on the street.

Many tools are available to meet the challenges faced by them, but they are not sufficient.

The most essentials thing a human can have is vision and it plays a very essential role in the life of a person either a person can see or not.

1.3 Goals and Objectives

- The application provides assistance to visually impaired people by providing a set of useful features.
- These various features can be provided through a single device, which reduces costs and complexity, and increases the practicality of the application.
- The presented results show that the proposed application successfully achieves its aims by providing the desired features.
- It has a user friendly interface customized for blind people.

Chapter 2

Literature Review

2.1 Study Of Research Paper

2.2 Literature Survey

1.Paper Name : Object Recognition App for Visually Impaired

Authors : Sumitra A. Jakhete; Pranit Bagmar; Avanti Dorle; Atharva Rajurkar; Piyush Pimplikar

Description : Vision is one of the most important senses that help people interact with the real world. There are nearly 200 million blind people all over the world, and being visually impaired hinders a lot of day to day activities. Thus it is very necessary for blind people to understand their surroundings, and to know what objects they interact with. This project proposes an android application to help blind people see through handheld device like mobile phone. It integrates various techniques to build a rich android application that will not only recognize objects around visually impaired people in real time but also give an audio output to assist them as quickly as possible. SSD (Single Shot Detector) Algorithm is used for the object recognition as well as detection. Also this algorithm gives nearly accurate results for real time object detection and is proven to be faster than other relative algorithms. The application further uses android tensorflow APIs and android TextToSpeech API to give audio output.

2.Paper Name : Disease Risk Prediction by Using Convolutional Neural Network.

AUTHORS : Rashmi Phalnikar

Description : Data analysis plays a significant role in handling a large amount of data in the healthcare. The previous medical researches based on handling and assimilate a huge amount of hospital data instead of prediction. Due to an enormous amount of data growth in the biomedical and healthcare field the accurate analysis of medical data becomes propitious for earlier detection of disease and patient care. However, the accuracy decreases when the medical data is partially missing. To overcome the problem of missing medical data, we perform data cleaning and imputation to transform the incomplete data to complete data. We are working on heart disease prediction on the basis of the dataset with help of Naïve bayes and KNN algorithm. To extend this work, we propose the disease risk prediction using structured data. We use convolutional neural network based unimodel disease risk prediction algorithm. The prediction accuracy of CNN-UDRP algorithm reaches more than 65

3.Paper Name : Smart Eye for Visually Impaired-An aid to help the blind people

AUTHORS : I Joe Louis Paul; S Sasirekha; S Mohanavalli; C Jayashree; P Moohana Priya; K Monika

Description : This paper presents an idea of developing a smart system which can assist the visually impaired people in their daily activities. Actually, there are many challenges faced by visually impaired people. In most cases, they require constant support in almost all scenarios especially in their day to day activities. Some of the major challenges include difficulty in moving from one place to another without the assistance of someone. Other challenges include difficulty in recognizing people, detecting obstacles, etc. In order to count avert this situation, we propose a "smart eye system" in this work. The device is a voice enabled system that would direct the visually challenged person in their day to day works. The device combines the various available technologies and integrates them into a single multipurpose device that can be used by the visually impaired. The paper discusses about the design of such a system and the challenges involved in designing the device.

4.Paper Name : Intelligent Eye: A Mobile Application for Assisting Blind People

AUTHORS : Milios Awad; Jad El Haddad; Edgar Khneisser; Tarek Mahmoud; Elias Yaacoub; Mohammad Malli

Description : The Intelligent Eye android mobile application is presented in this paper. The application provides assistance to visually impaired people by providing a set of useful features: light detection, color detection, object recognition, and banknote recognition. It has a user friendly interface customized for blind people. These various features can be provided through a single device, which reduces costs and complexity, and increases the practicality of the application. The presented results show that the proposed application successfully achieves its aims by providing the desired features.

5.Paper Name : Mobile App for Word Recognition and Visualization of Objects Using Indonesian Language Google Speech to Text for Deaf Students

AUTHORS : Kristiawan Nugroho; Muljono Muljono; Dhendra Marutho; Sugeng Murdowo

Description : Disability is a condition of many people's limitations throughout the world, including in Indonesia. According to research, deaf sufferers are the most disabled disabilities in Indonesia, including deaf sufferers who are still as school students. Basic learning how to communicate in word and object recognition between teacher and deaf students is a problem that must be solved to encourage deaf students to communicate well. Several studies conducted previously have succeeded in producing a variety of Android-based applications that help deaf in learning. Otherwise, apps that used English and the absence of visualization of an object make students with hearing impairment at the elementary school level find it difficult to understand the form. This research builds a mobile speech to text application and object visualization by utilizing Google speech to text in Indonesian, which is useful in translating sound into text accompanied by display of objects and their colors. Students, teachers, and parents can use applications as alternative learning in addition to conventional methods that are fun for deaf students so that they will be more enthusiastic in learning.

Chapter 3

Experimental Setup

3.1 System Requirements

3.1.1 Database Requirements

The Firebase Realtime Database is a cloud-hosted database in which data is stored as JSON. The data is synchronized in real-time to every connected client. All of our clients share one Realtime Database instances and automatically receive updates with the newest data, when we build cross-platform applications with our iOS, and JavaScript SDKs.

The Firebase Realtime Database is a NoSQL database from which we can store and sync the data between our users in real-time. It is a big JSON object which the developers can manage in real-time. By using a single API, the Firebase database provides the application with the current value of the data and updates to that data. Real-time syncing makes it easy for our users to access their data from any device, be it web or mobile.

The Realtime database helps our users collaborate with one another. It ships with mobile and web SDKs, which allow us to build our app without the need for servers. When our users go offline, the Real-time Database SDKs use local cache on the device for serving and storing changes. The local data is automatically synchronized, when the device comes online.

3.1.2 Software Requirements(Platform Choice)

IDE : Android Studio

Coding Language : Kotlin

Operating System : Windows 10 (64 Bit)

3.1.3 Hardware Requirements

RAM : 8 GB

Hard Disk : 500 GB

Processor : Intel i5 Processor

3.1.4 Project Scope

Developing an Android-based app for blind people requires careful consideration of their unique needs and challenges. Such an app can significantly improve accessibility and enhance the quality of life for visually impaired individuals.

3.1.5 Assumptions and Dependencies

Assumptions and Dependencies

- 1. End User application will be developed in Windows OS.
- 2. All scripts shall be written in Python or Kotlin language.
- 3. Application design pattern shall be Singleton.

Chapter 4

Software Requirement Specification

4.1 EXTERNAL INTERFACE REQUIREMENT

4.1.1 User Interface

Application Based on Women Safety.

4.1.2 Hardware Interfaces:

- RAM : 8 GB
- Hard Disk : 500 GB
- Processor : Intel i5 Processor

4.1.3 Software Interfaces

- Language: Kotlin is a cross-platform, statically typed, general-purpose programming language with type inference. Kotlin is designed to interoperate fully with Java, and the JVM version of Kotlin's standard library depends on the Java Class Library, but type inference allows its syntax to be more concise.Kotlin is a modern statically typed programming language used by over 60 of professional Android developers that helps boost productivity, developer satisfaction, and code safety. Kotlin is a cross-platform, statically typed, general-purpose programming language with type inference. Kotlin is designed to interoperate fully with Java.

- Android Visual Studio: Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' Intel-liJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems.Android Studio provides a unified environment where you can build apps for Android phones,tablets, Android Wear, Android TV, and Android Auto. Structured code modules allow you to divide your project into units of functionality that you can independently build, test, and debug

4.2 NON FUNCTIONAL REQUIREMENT

4.2.1 Performance Requirements

- The performance of the functions and every module must be well. The overall performance of the software will enable the users to work efficiently. Performance of encryption of data should be fast. Performance of the providing virtual environment should be fast Safety Requirement. The application is designed in modules where errors can be detected and xedeasily. This makes it easier to install and update new functionality if required.

4.2.2 Safety Requirement

- The application is designed in modules where errors can be detected and fixed easily. This makes it easier to install and update new functionality if required.

4.2.3 Software Quality Attributes

- Our software has many quality attribute that are given below:-

- Adaptability: This software is adaptable by all users.

- Availability: This software is freely available to all users. The availability of the software is easy for everyone.

- Maintainability: After the deployment of the project if any error occurs then it can be easily maintained by the software developer.

- Reliability: The performance of the software is better which will increase the reliability of the Software.

- User Friendliness: Since, the software is a GUI application; the output generated is much user friendly in its behavior.

- Integrity: Integrity refers to the extent to which access to software or data by unauthorized persons can be controlled.

- Security: Users are authenticated using many security phases so reliable security is provided.

- Test ability: The software will be tested considering all the aspects.

4.3 Analysis Models: SDLC Model to be applied

SDLC Models stands for Software Development Life Cycle Models. In this article,we explore the most widely used SDLC methodologies such as Agile . Each software development life cycle model starts with the analysis, in which the Also, here are defined the technologies used in the project, team load. One of the basic notions of the software development process is SDLC models which stands for Software Development Life Cycle models. SDLC – is a continuous process, which starts from the moment, when it's made a decision to launch the project, and it ends at the moment of its full remove from the exploitation. There is no one single SDLC model. They are divided into main groups, each with its features and weaknesses.

1.Requirement Analysis - Requirement Analysis is the most important and necessary stage in SDLC. The senior members of the team perform it with inputs from all the stakeholders and domain experts or SMEs in the industry. Planning for the quality assurance requirements and identifications of the risks associated with the projects is also done at this stage. Business analyst and Project organizer set up a meeting with the client to gather all the data like what the customer wants to build, who will be the end user, what is the objective of the product. Before creating a product, a core understanding or knowledge of the product is very necessary.

2. System Design - The next phase is about to bring down all the knowledge of requirements, analysis, and design of the software project. This phase is the product of the last two, like inputs from the customer and requirement gathering.

3. Implementation - In this phase of SDLC, the actual development begins, and the programming is built. The implementation of design begins concerning writing code. Developers have to follow the coding guidelines described by their management and programming tools like compilers, interpreters, debuggers, etc. are used to develop and implement the code.

4. Testing - After the code is generated, it is tested against the requirements to make sure that the products are solving the needs addressed and gathered during the requirements stage. During this stage, unit testing, integration testing, system testing, acceptance testing are done.

5. Deployment - Once the software is certified, and no bugs or errors are stated, then it is deployed. Then based on the assessment, the software may be released as it is or with suggested enhancement in the object segment. After the software is deployed, then its maintenance begins.

6. Maintenance - Once when the client starts using the developed systems, then the real issues come up and requirements to be solved from time to time. This procedure where the care is taken for the developed product is known as maintenance.

4.4 System Implementation Plan

The System Implementation plan table, shows the overall schedule of tasks compilation and time duration required for each task.

Sr. No.	**Name/Title**	**Start Date**	**End Date**
1	Preliminary Survey		
2	Introduction and Problem Statement		
3	Literature Survey		
4	Project Statement		
5	Software Requirement And Specification		
6	System Design		
7	Partial Report Submission		
8	Architecture Design		
9	Implementation		
10	Deployement		
11	Testing		
12	Paper Publish		
13	Report Submission		

Chapter 5

Software Information

Android :

Before learning all topics of android, it is required to know what is android.Android is a software package and linux based operating system for mobile devices such as tablet computers and smartphones.It is developed by Google and later the OHA (Open Handset Alliance). Java language is mainly used to write the android code even though other languages can be used.The goal of android project is to create a successful real-world product that improves the mobile experience for end users.

Features of Android

After learning what is android, let's see the features of android. The important features of android are given below:

1) It is open-source.

2) Anyone can customize the Android Platform.

3) There are a lot of mobile applications that can be chosen by the consumer.

4) It provides many interesting features like weather details, opening screen, live RSS (Really Simple Syndication) feeds etc.

Android aApplication

There are many android applications in the market. The top categories are:

1. Entertainment
2. Tools
3. Communication
4. Productivity
5. Personalization
6. Music and Audio
7. Social

8. Media and Video
9. Travel and Local etc.

Kotlin and XML Gui:

Kotlin is a statically typed, general-purpose programming language developed by JetBrains, that has built world-class IDEs like IntelliJ IDEA, PhpStorm, Appcode, etc. It was first introduced by JetBrains in 2011 and is a new language for the JVM. Kotlin is an object-oriented language, and a "better language" than Java, but still be fully interoperable with Java code. Kotlin is sponsored by Google, announced as one of the official languages for Android Development in 2017. Package versions in Anaconda are managed by the package management system conda. This package manager was spun out as a separate open-source package as it ended up being useful on its own and for other things than Python. There is also a small, bootstrap version of Anaconda called Miniconda, which includes only conda, Python, the packages they depend on, and a small number of other packages. XMLGUI is a KDE framework for designing the user interface of an application using XML, using the idea of actions. In this framework, the programmer designs various actions that his application can implement, with several actions defined for the programmer by the KDE framework, such as opening a file or closing the application. Each action can be associated with various data including icons, explanatory text, and tooltips. The interesting part to this design is that the actions are not inserted into the menus or toolbars by the programmer. Instead, the programmer supplies an XML file, which describes the layout of the menu bar and toolbar. Using this system, it is possible for the user to redesign the user interface of an application without needing to touch the source code of the program in question. In addition, XMLGUI is useful for the KParts component programming interface for KDE, as an application can easily integrate the GUI of a KPart into its own GUI. The Konqueror file manager is the canonical example of this feature

FireBase Appcompact For UI

Firebase auth-authentication

Firebase UI Authentication is a way to add a complete sign-in system to our app, where Firebase provides user interface to them. Firebase UI provides a drop-in auth solution which is used to implement authentication on mobile devices and websites.

Firebase UI can be easily customized to fit with the rest of our app's visual style. It is open-source, so we are not constrained in modifying the user experience to meet our apps need.

There are the following steps to use Firebase UI Authentication:

Set up sign-in methods:

Enable authentication method in the firebase console. For email address and password, phone number sign-in, and any identity providers.

We have to complete the configuration if anyone requires for identity providers.

Setting our OAuth redirect URL.

Customize the sign-in UI.

For customizing the sign-in and UI, we have to set some Firebase UI options or fork the code on GitHub.

To perform the sign-in flow, use Firebase UI:

Import the Firebase UI library.

Specify the sign-in method which we want to support.

Initiate the Firebase UI sign-in flow.

FireBase Database

RealTime Database

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. When you build cross-platform apps with our Apple platforms, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.

The Firebase Realtime Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code. Data is persisted locally, and even while offline, realtime events continue to fire, giving the end user a responsive experience. When the device regains connection, the Realtime Database synchronizes the local

data changes with the remote updates that occurred while the client was offline, merging any conflicts automatically.
The Realtime Database provides a flexible, expression-based rules language, called Firebase Realtime Database Security Rules, to define how your data should be structured and when data can be read from or written to. When integrated with Firebase Authentication, developers can define who has access to what data, and how they can access it.

Features

- Editor

  Work efficiently in a multi-language editor with a function/class browser, real-time code analysis tools (pyflakes, pylint, and pycodestyle), automatic code completion (jedi and rope), horizontal/vertical splitting, and go-to-definition.

- Interactive console

  Harness the power of as many IPython consoles as you like with full workspace and debugging support, all within the flexibility of a full GUI interface. Instantly run your code by line, cell, or file, and render plots right inline with the output or in interactive windows.

- Documentation viewer

  Render documentation in real-time with Sphinx for any class or function, whether external or user-created, from either the Editor or a Console.

Chapter 6

System Design

6.1 System Architecture

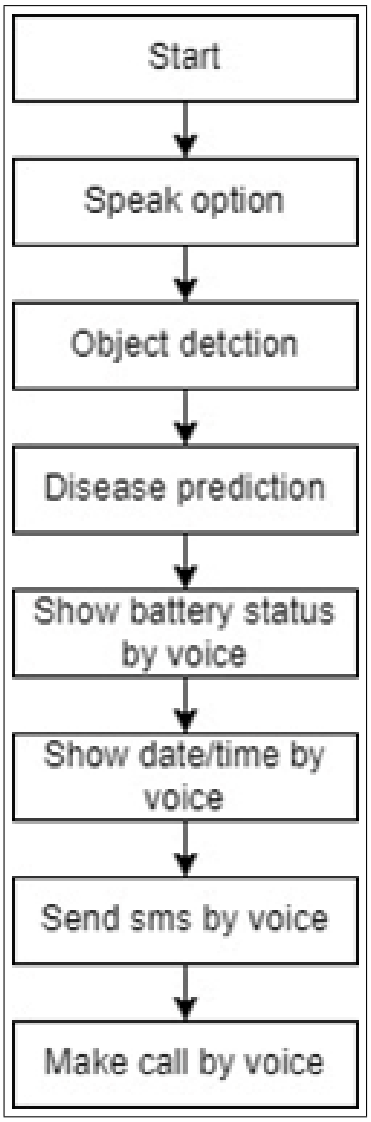

Figure 6.1: System Architecture

6.1.1 Data Flow Diagram

In Data Flow Diagram,we Show that flow of data in our system in DFD0 we show that base DFD in which rectangle present input as well as output and circle show our system,In DFD1 we show actual input and actual output of system input of our system is text or image and output is rumor detected like wise in DFD 2 we present operation of user as well as admin.

Figure 6.2: Data Flow(0) diagram

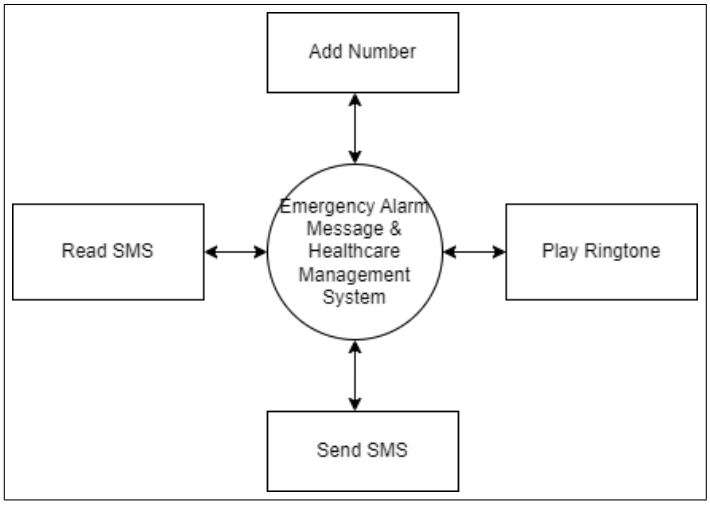

Figure 6.3: Data Flow(1) diagram

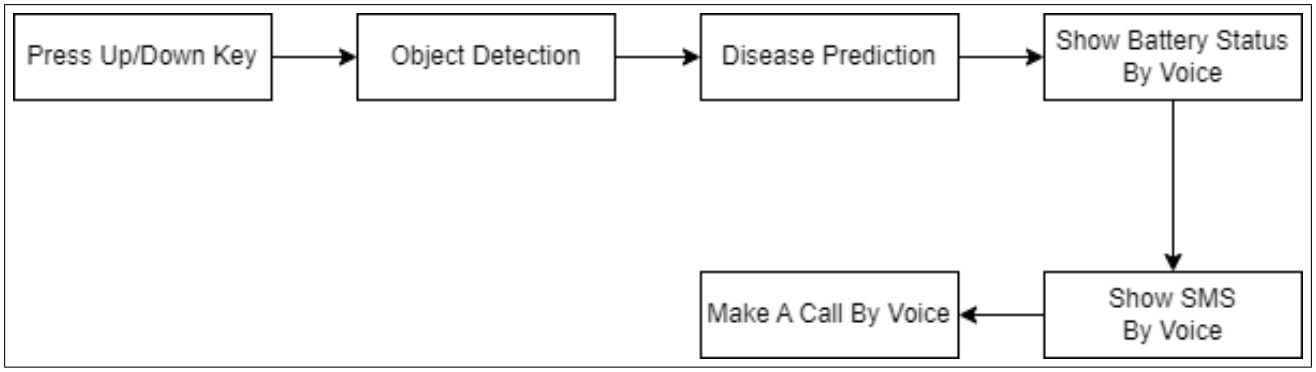

Figure 6.4: Data Flow(2) diagram

6.2 UML DIAGRAMS

Unified Modeling Language is a standard language for writing software blueprints.The UML may be used to visualize,specify,construct and document the artifacts of a softwareintensive system.UML is process independent,although optimally it should be used in process that is use case driven,architecture-centric,iterative,and incremental.The Number of UML Diagram is available.

Class Diagram.

Use case Diagram.

Activity Diagram.

Sequence Diagram.

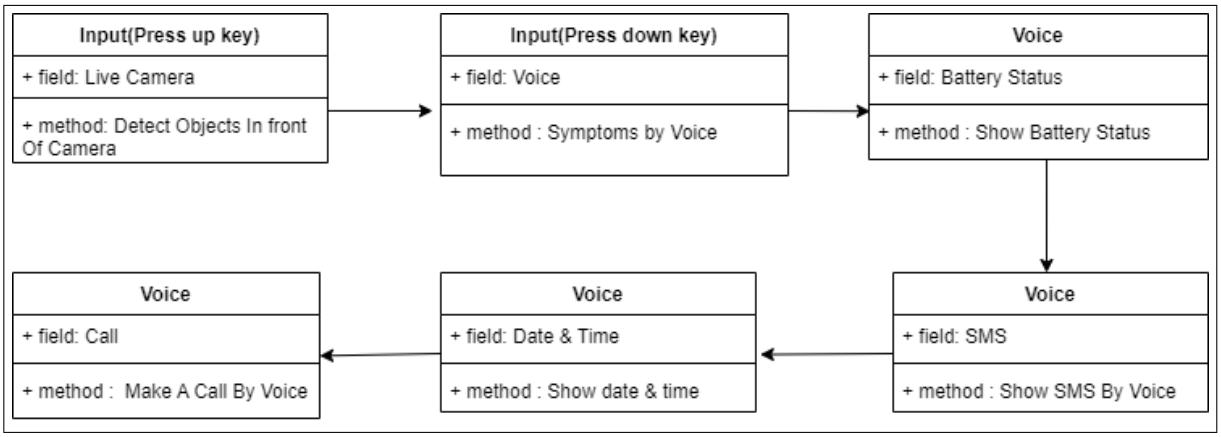

Figure 6.5: Class Diagram

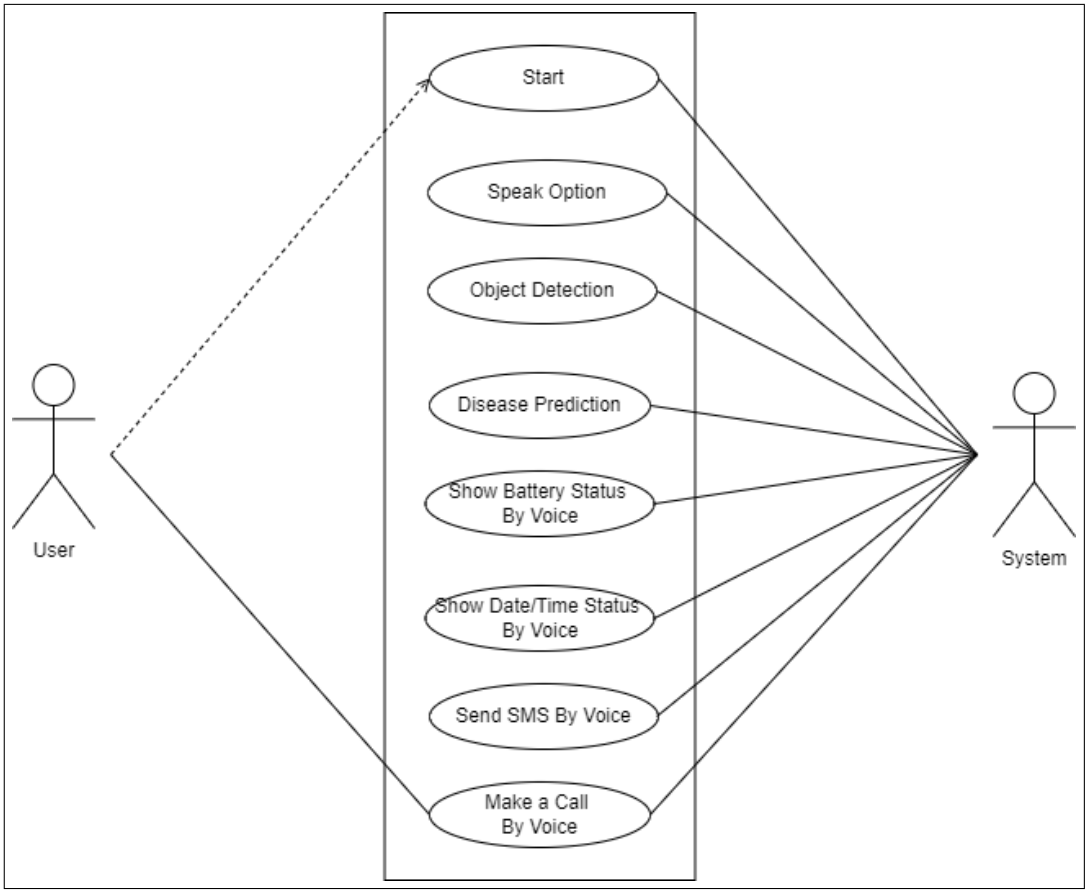

Figure 6.6: Use case Diagram

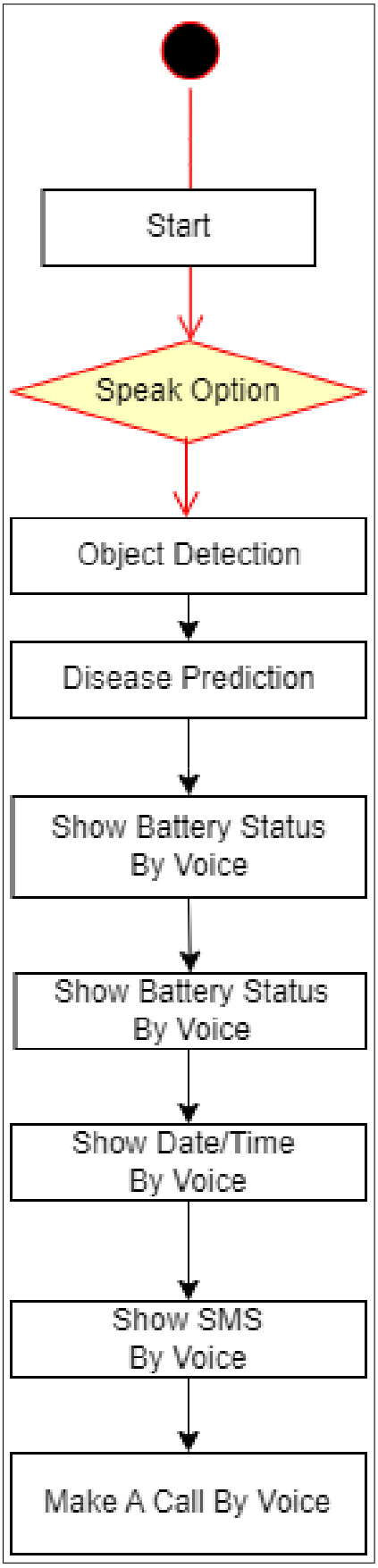

Figure 6.7: Activity Diagram

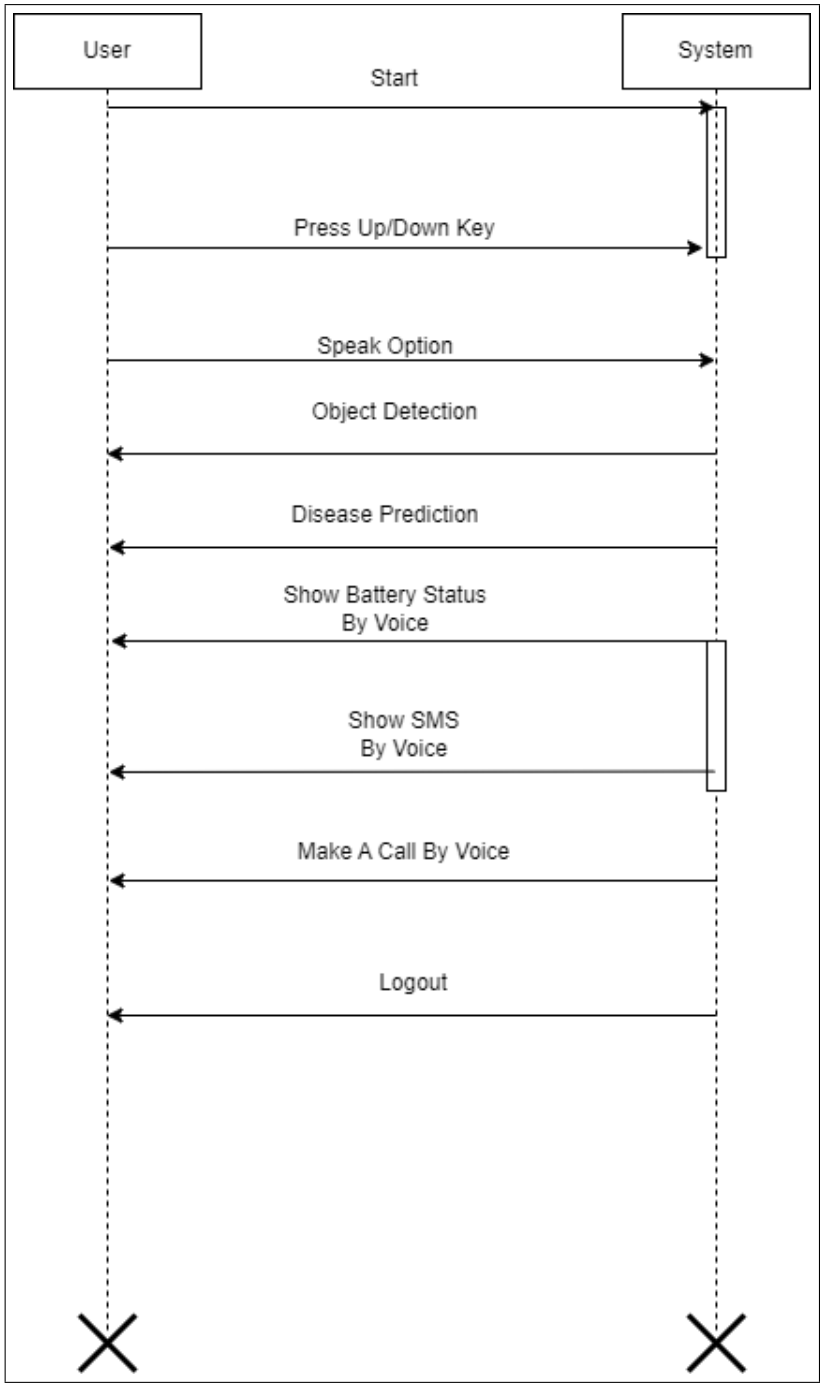

Figure 6.8: Sequence Diagram

Chapter 7

Project Plan

Project Plan

NO	TASK	DURATION(DAYS)
1	Group Formation	4
2	Decide Area Of Interest	4
3	Search Topic	5
4	Topic Selection	5
5	Sanction Topic	5
6	Search Related Information	12
7	Understanding Concept	7
8	Search Essential Document(IEEE & White Paper, Software)	6
9	Problem Definition	2
10	Literature Survey	5
11	SRS	14
12	Project Planning	2

Figure 7.1: project plan

7.1 Project Estimates

7.1.1 Reconciled Estimates

We are using waterfall model for our project estimation.

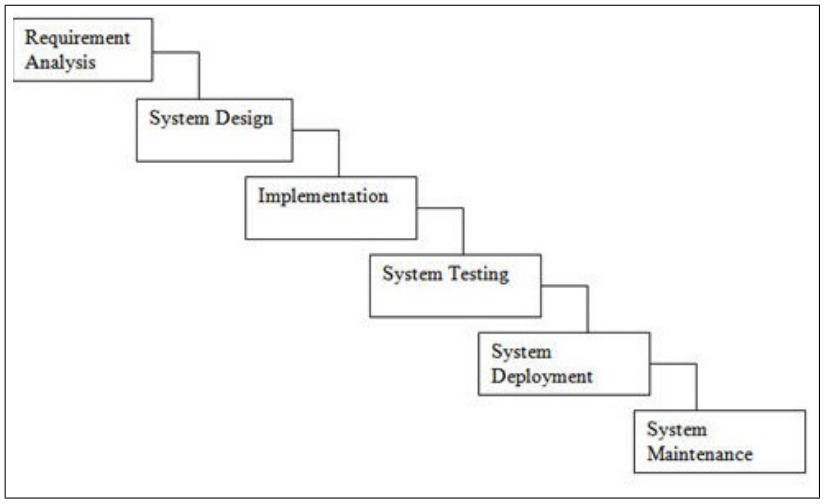

Figure 7.2:

1.Requirement gathering and analysis: In this step of waterfall we identify what are various requirements are need for our project such are software and hardware required, database, and interfaces.

2.System Design: In this system design phase we design the system which is easily understood for end user i.e. user friendly. We design some UML diagrams and data flow diagram to understand the system flow and system module and sequence of execution.

3.Implementation: In implementation phase of our project we have implemented various module required of successfully getting expected outcome at the different module levels. With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.

4.Testing: The different test cases are performed to test whether the project module are giving expected outcome in assumed time. All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

5.Deployment of System: Once the functional and non-functional testing is done, the

product is deployed in the customer environment or released into the market.

6.Maintenance: There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards like a waterfall through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name "Waterfall Model". In this model phases do not overlap.

Chapter 8

Conclusion

The application has a very simple and easily navigable User Interface that suits the visually impaired users. As soon as the application is launched, the camera will start capturing the real time video. As soon as the user presses a button, the server-side backend algorithm will start processing it and notify the user accordingly as output audio. The Yolo algorithm can be stopped by pressing the same button again. This is how objects around the blind people and their positions are detected and conveyed to them via an audio output using the YOLOv3-tiny algorithm. Proposed a system to predict the disease based on symptoms given by user. We provide Hash set dataset for disease prediction.

Chapter 9

Other Specifications

9.1 Advantages

- The visual world change into an audio world.
- Notify the blind people about the objects in their path.
- Help visually impaired people to navigate independently without any external assistance.
- Disease prediction identify patients at risk of disease or health conditions.
- Improve quality of care and avoid potential hospital admissions.

9.2 Application

- A set of useful features.
- It has a user-friendly interface.
- It supports various notifications.
- It is used for social media implementations'
- It works as a guidance for people.

9.3 Limitations

- The same object can have completely different shapes and sizes. Computer vision needs to do a lot of research to read an object and understand what it means.

- When it comes to video, detectors need to be trained to perform analysis in an ever-changing environment.
- One of the biggest difficulties of object detection is that an object viewed from different angles may look completely different.

Chapter 10

Reference

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