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Research On Non-Luminous Hope Application

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Abstract:

Our study is entitled NLHA (Non-Luminous Hope Application). We have made this application using Android Studio and it is based on the blind helper. It essentially helps the blind people to do their day-to-day tasks with great ease. This application helps visually impaired people to use smart phones like that normal people use and ease their efforts while using this application. The reliability of this application is more since the users can depend on this application with great ease. This system is used to help to visually impaired people to access to the most important features of the phone enhancing the quality of the system, making use of different custom layouts and using speech to text. This application has a user-friendly Graphical User Interface (GUI) which helps impaired people to use the application with less efforts and with ease. This system is portable which means it is easy to move from one place to other.

Keywords — **Android** Studio IDE, speech to text, text to speech, reliability, portable, easy, TensorFlow, OCR reader.

I. INTRODUCTION

Non-Luminous means that those who don't produce their own light, so the name suggest that this system is designed for blind, impaired peoples those who are not able to see. This project is 100% software project does not include any hardware part. This system provides features such as current location, detect weather, calculator, time and date, battery status, detect objects, recognize the currency, read text. We have added one new feature in this application which is read inbox messages, which helps the user to read inbox messages by just swiping user need to swipe up to read the next message in the inbox and to read previous message user need to swipe down or user can directly go to home by long pressing on the screen. This application is totally swipe based does not need keyboard. Along with impaired peoples this application can also be used by common people who want to use this application because the user interface to very easy to understand the flow of the application.

II. RESEARCH IN LITERATURE

1. Artificial intelligence and disability: too much promise, yet too little substance: -

The idea mainly focused on designing and implementing an assistive system for visually impaired persons to access the Android

smartphones easily and the proposed system is used to help the visually impaired to have access to the most important features of the phone. The aim is to design a low-cost and high-performance assistive device for daily activities of visually impaired persons.

2. **How People with Disabilities Use the Web: -**

The following resource describe how people with age-related impairments use the Web and also discusses some tools and approaches that people with different kinds of disabilities use to browse the web and the barriers they encounter due to poor design.

3. **AI Based Voice Assistant using Python: -**

In this paper, the design and implementation of Digital Assistance is discussed. The project is built using open-source software modules with PyCharm community backing which can accommodate any updates in the near future. The modular nature of this project makes it more flexible and easier to add additional features without disturbing current system functionalities.

4. **Virtual assistant for the visually impaired: -**

In this paper, the author explains how he built a software that provides a new dimension to access and provide commands to any websites.

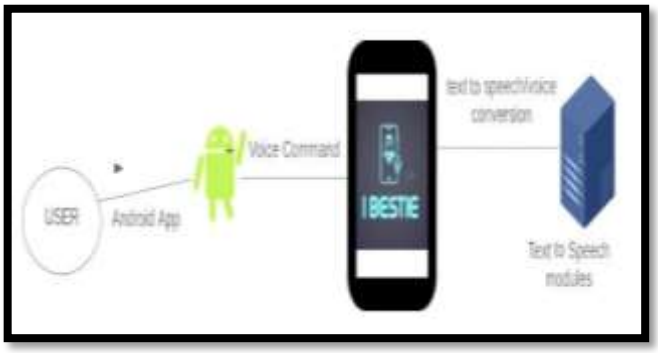
5. **Working Together: People with Disabilities and Computer Technology: -**

These resources describe the barriers faced by people with disabilities and also describes tools used by them.

6. Nishank M. Tembhurne. In this paper they have Android phone-controlled voice gesture and touchscreen operated wheelchair where voice and gesture is recognized through android. Developers also created a universal voice control on android which is used to launch android application via voice commands.

III. PROPOSED METHODOLOGY:-

We have added the required dependencies that allows us to include external library or local jar files or other library modules in our project. In the (Extensible Markup Language) XML we have made the user interface (UI) part of our applications. In MainActivity.java we have created all the methods that will help user to open any particular feature with a single voice command. By left swiping on the screen user will be able to read the features of our application. And by right swiping on the screen user will be able to give the input through voice command. After giving the voice command user will be redirected to the particular activity.

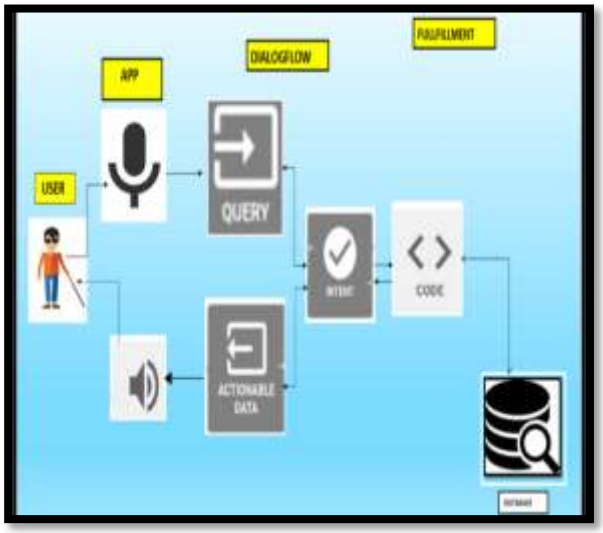


[Fig. 1 system module]

VI. PROCEDURE

When user opens the application, the system provides the voice command in English language welcoming the user. Then it reads all the features of the application provided to the user. It provides the command such as to see the features of the application swipe to left and to implement the feature you want swipe right and speak the feature you want. It converts the voice command given by the user to the text and it compares that text with the commands saved in the system. If the command given by user is not valid the system will provide voice message command is not valid, please provide the input again. And if the command is detected by the system, then it will give response to user in voice command what the user want to know. For further help the system

will give command to swipe left/right and will perform tasks as per user command.
As the user is giving the command at the same time system converts the voice command to text and system sends that text command further to check if command is valid or not and if the command is valid system converts text to speech to give response to the user. This is how our application does the conversion form speech to text (STT) and text to speech (TTS).



[Fig. 2 Procedure of application.]

VII. Algorithm and flow chart:

Step 1-Start.

Step 2-System read features.

Step 3-Swip right to implement command.

Step 4-Converts speech to text.

Step 5-Extecuts the command.

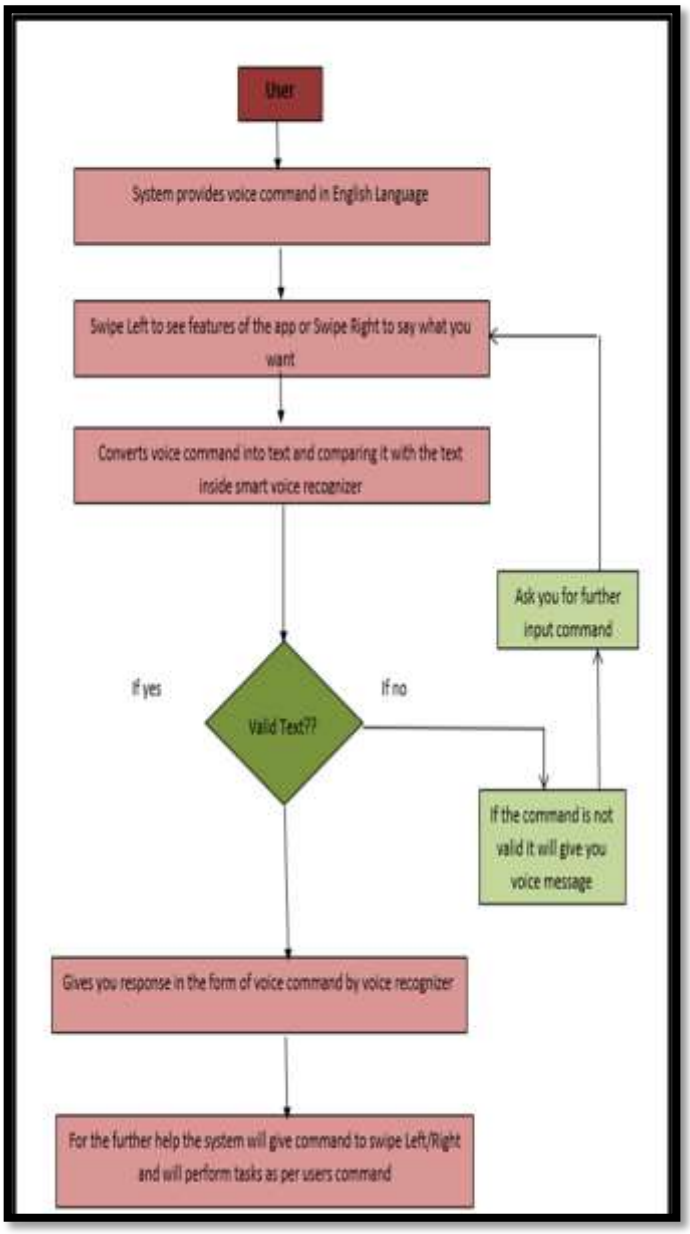
Step 6-Gives response in voice command.

Step 7-Swipe left for features.

Step 8-If command not valid, gives voice message.

Step 9-Stop.

FlowChart:-



[Fig. 3 Flow chart.]

VIII. Tools and Technology:

A. Java

Our application contains MainActivity in that java is used. Java is a programming language, it is high-level, object-oriented class-based language. Java is designed for few dependencies as possible. It implements the important feature of write once, run anywhere (WORA) which means java code can be run anywhere it does not need to recompile. Java uses Java Virtual Machine (JVM) to run. Java was released on May 1995 and is developed by James Gosling at the sun Microsystem.

- **Features:**
  1. Platform Independent.
  2. Object-Oriented Programming Language.
  3. Simple.
  4. Secure.
  5. Robust

B. XML

We have developed user interface UI of our application in XML.XML stands for Extensible Markup Language.XML is same like HTML.XML is a file formatting language which stores, transmits and reconstructs the arbitrary data. It is an encoding document which can be read by humans as well as machines. It is designed for simplicity, generality and usability on the internet. XML is designed to support Unicode and used to make websites.

- **Features:**
  1. Extensible and Human Readable.
  2. Overall Simplicity.
  3. Separates Data from HTML
  4. Allows XML Validation.
  5. XML Supports Unicode**.**

C. SQLLite

Our application contains SQLite database. SQLite is used to provide lightweight, embedded database. SQLite contains the ACID properties. It implements a self-contained, serverless, zero error database. It is most common choice as embedded database local storages in applications. It is a database engine. In single file data is stored in SQLite.

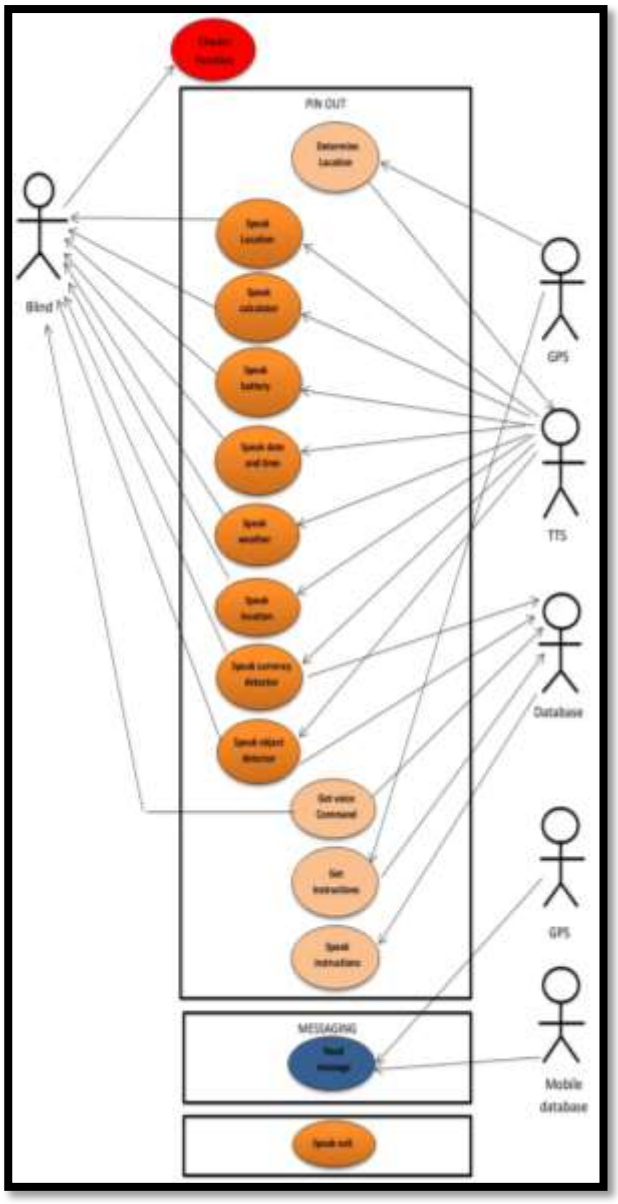
- **Features:**
  1. SQLite is totally free.
  2. SQLite is serverless.
  3. SQLite is very flexible.
  4. Configuration Not Required.
  5. SQLite is a cross-platform DBMS.

D. Android Studio

We have made our application in Android Studio IDE. It is an Integrated Development Environment designed on Android development. It is available for operating system such as Windows, Linux and MacOS. It was announced on 16 May 2013.

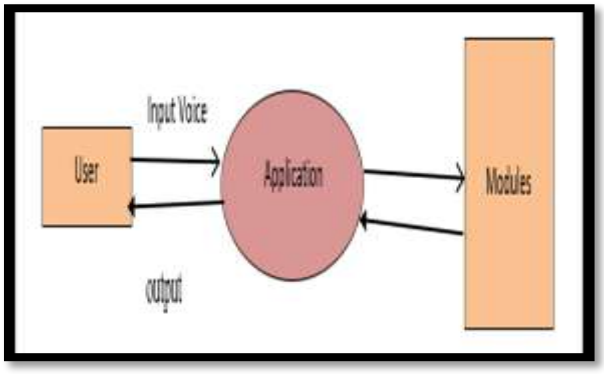
- **Features:**
  1. It has a flexible Gradle-based build system.
  2. It has a fast and feature-rich emulator for app testing.
  3. Android Studio has a consolidated environment where we can develop for all Android devices.
  4. Apply changes to the resource code of our running app without restarting the app.
  5. Android Studio provides extensive testing tools and frameworks.

***E.** Use Case Diagram:*



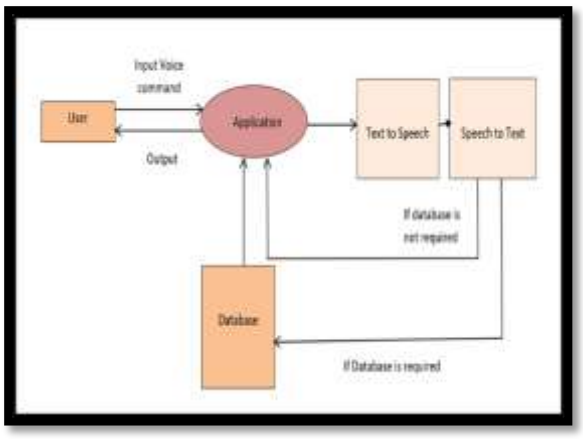
[Fig. 4 Use Case Diagram.]

F. Data Floe Diagram Level 0



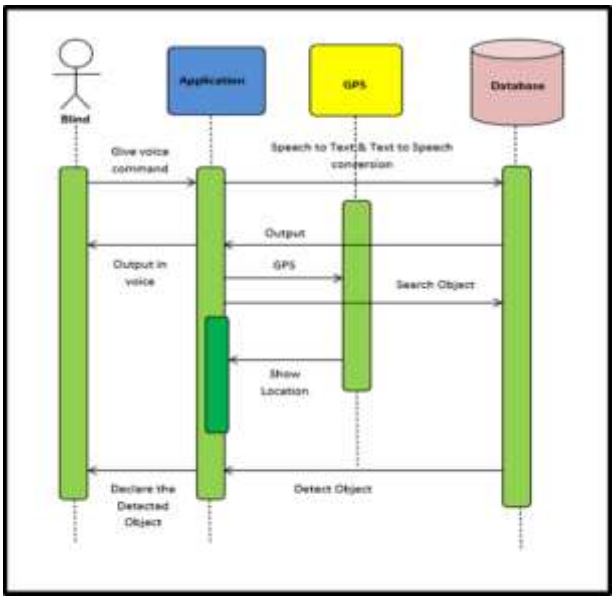
[Fig. 5 DFD level 0]

G. Data Flow Diagram Level 1



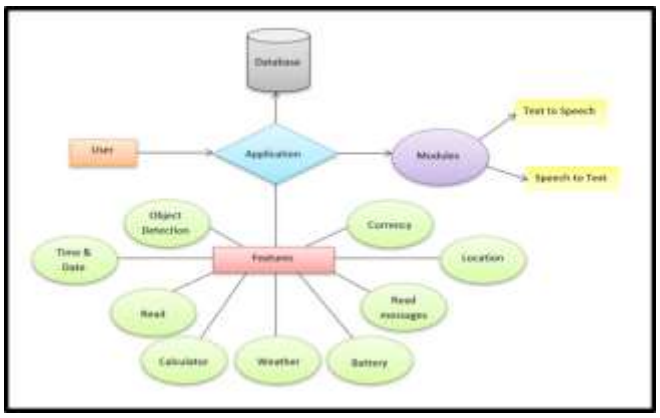
[Fig. 6 DED level 1]

H. Sequence Diagram



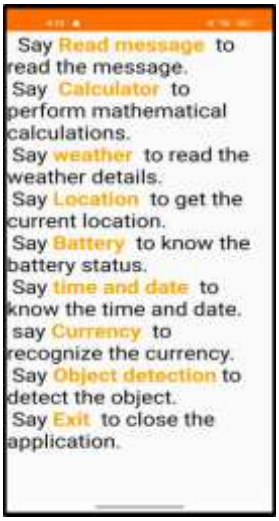
[Fig. 7 Sequence Diagram]

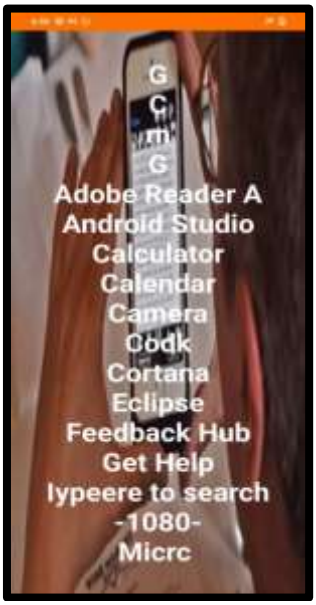
I. Entity Relationship Diagram:



[Fig. 8 ER diagram.]

- ***Outputs:***





IX. CONCLUSION

At present, mobiles apps in smart phones are used to perform the most of our daily activities. But the people with vision impairment require assistance to access these mobile apps through handled devices like mobile and tablets. Google, Android applications has been developing various mobile apps for visually impaired people. Still, it needs to provide more effective facilities in app by adopting and synergizing suitable techniques form Artificial Intelligence.

Our project's conclusion is that many individuals have low vision and some kind of visual impairment. We used Android studio to create our project in order to prevent this problem. This system is very reliable and offers hands free user experience to the blinds and is quite indulging. This system focusses on the problem faced by the blind people and how their problems will be reduced by using this system. "NON-LUMINOUS HOPE APPLICATION" project may be advantageous on a large scale, because it provides a user-friendly GUI (Graphical User Interface).

ACKNOWLEDGMENT

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