VIRTUAL ASSISTANT FOR BLIND PEOPLE

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Introduction:
The advancements in the field of artificial intelligence have given rise to various virtual assistants such as Siri in iPhone, Google Allo, Microsoft Cortana, etc. Despite this advancement, there is very little done to implement these technologies to help the blind community. The objective of this project is to help the blind people in various day-to-day activities such as identifying the physical objects in front of them, giving the description of the various objects by scanning the QR code, information about various hospitals, and allowing them to give input to all functionalities through voice.

Objectives:
1. Mobile technology is one of the most abundant technologies found across the world.
2. Currently, the biggest application store—playstore lacks a blind-friendly application.
3. The proposed project intends to create an application which will help the visually impaired person to carry out various tasks with ease.
4. The functionalities that are provided are,
   5. Object Description
   6. Image Recognition
   7. Handwriting Recognition
   8. Hospital Appointment Booking

Methodology:
The project methodology will be based on the popular Waterfall model.

Requirements

Functional Requirements
- The system must recognize the objects in front of them and give out the name of the object as a voice output. The system must recognize the medicines and eatables and give the required details about the products just by scanning the QR code.
- The system must take the voice input from the user.
The output should be a voice output.

**Non-Functional Requirements**

- The system shall provide information about various hospitals.
- The project shall commence from the month of February and shall be completed by May 3rd week.
- The project will make use of various machine learning libraries such as OpenCV, Tensorflow, Microsoft Cognitive Services.
- The object recognition should have an accuracy of 7 out of 10.
- The language chosen to implement the project will be in java and python.

**Implementation:**

- Speech to text – A statistical modeling system is used to convert the speech input to the text output. Specifically Hidden Markov Model is implemented.
- The text generated is converted to a set of tokens through the help of tokenizer.
- These set of tokens are analyzed by a syntactic analyzer to present a syntactically valid sentence.
- Using these parsed tokens, and question and intent analysis the user commands are detected and appropriate actions are taken.
- Microsoft Cognitive Services libraries are used to detect the object in-front of the camera and the results are analyzed.
- Using speech synthesis the text output from the system is converted to synthesized speech.

**Results and conclusion:**

The proposed project helps the blind user to recognize the object or the threat in front of them, give a detailed description of the object by a simple scan of QR code, allows them to book an appointment at the specified hospital and recognize the handwritten text. It reduces their dependency on the other people to carry out day to day activities.