

# Vocational Training for Visually Impairment

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**Abstract:** *The "Design and Development of Unified Health Interface" project aims to revolutionize the healthcare industry by creating an innovative and comprehensive platform that unifies health-related data and services, ultimately enhancing the patient experience and improving healthcare outcomes. Smart healthcare cards manage patient identity and give practitioners and pharmacists secure access to their medical records. The patient can be validated using a unique NFC-enabled health card which is allocated to each citizen and after that, the patient's health records can be obtained using an Android application with his/her permission. This concept will help the government to create a centralized database of the health of citizens. In emergencies, the interface provides quick access to critical medical information, enhancing patient safety and healthcare outcomes. Additionally, the interface will provide secure and convenient communication channels between patients and healthcare professionals, promoting better coordination and remote healthcare services. The project also emphasizes the importance of data security and privacy, ensuring compliance with all relevant healthcare regulations*

**Keywords:** E-learning, training visually impaired, Speech recognition, Assistive technologies, User-centred design, usability testing

## I. INTRODUCTION

People with visual limitations or impairments, frequently those with vision impairments or loss, are those whose eyesight cannot be restored by glasses, contact lenses, or other medical procedures. People who are visually blind navigate their surroundings using assistive technologies, equipment, and senses like touch, hearing, and spatial awareness. This paper suggests a fresh method for giving blind people vocational training. As a result, we created a software program for vocational training that is especially suited for people with visual impairments. This groundbreaking solution completely changes how people with visual impairments access and participate in vocational education. Modern technology is used by this specialized software to give visually impaired students a welcoming and powerful learning environment. The software makes sure that people with visual impairments can take part in vocational training programs in full through a combination of accessibility features and adaptive learning technologies. Users can navigate the software using auditory due to screen reader compatibility, while people with low eyesight can see more clearly due to high contrast levels. The software offers a variety of vocational training programs in many fields that are suited to the requirements and preferences of visually impaired students. This guarantees that people can obtain the knowledge and skills needed for their chosen careers. This software's capacity to offer personalized learning experiences is one of its main benefits. By choosing courses and modules that match their job objectives, learners can tailor their learning paths. Users are free to learn at their own pace with the assistance of additional support as needed because of the software's ability to adapt to individual learning preferences. In summary, the software for vocational training for people with visual impairments creates new possibilities and gives them the confidence to follow their professional goals. This program lowers obstacles, encourages independence, and gives visually impaired learners the skills and confidence they need to succeed in their chosen professions by utilizing technology and fostering an inclusive learning environment.

**II. LITERATURE REVIEW**

S. NO	PAPER/SURVEY NAME	AUTHOR NAME	YEAR OF PUBLICATION
1	Text Reader for Visually Impaired	Nadhir, M., Mohamed, A. S. A., Syafiq, A., Abdull Sukor, A. S., Teng, O.	(2021)
2	Exploring End User's Perception of Flutter Mobile Apps	Ola Dahl	(2019)
3	A New Human Voice Recognition System	Mahesh Pala	(2016)
4	An Overview of Speech Recognition and Speech Synthesis Algorithms		
5	National Blindness & Visual Impairment Survey India		(2015-2019)

Nadhir, M., Mohamed, A. S. A., Syafiq, A., Abdull Sukor, A. S., Teng, O. (2021). Text Reader for Visually Impaired Person

This paper proposes an affordable mobile application which is designed for the visually impaired person. The mobile application is able to capture the image of printed material with a mobile camera. The captured image is then converted to text by using image-to-text conversion in Optical Character Recognition (OCR) framework. Finally, the text will be read out into speech format using text-to-speech conversion in Text to Speech (TTS) framework. Android Studio is used to create the mobile application for the text reader system. It is divided into two parts which are known as the user side and the system side.

Exploring End User's Perception of Flutter Mobile Apps-Ola Dahl -2019-02-0

Many technologies for creating cross-platform applications have emerged over the years, and new technologies are released every year. One such technology is Flutter, which is a mobile application SDK (Software Development Kit). Flutter promises the ability to build native applications on iOS and Android that achieve native performance. Flutter apps are using the Dart programming language. Dart is developed and maintained by Google. It was developed as a successor to JavaScript and incorporates many of the features in the ES7 JavaScript standard [18]

A New Human Voice Recognition System-Mahesh Pala-December 2016

Alan Conversational Platform permits designers to make several assistants, similar to Google (Assistant), Amazon (Alexa), Apple (Siri), but confined to a particular application. Alan makes web application more adaptive with improved user interface and updates. Alan is an exceptionally progressed framework that incorporates BDA, ML, voice and speech recognition, NLP, and other trend setting innovations.

An Overview of Speech Recognition and Speech Synthesis Algorithms

This paper describes about some speech synthesis and speech recognition algorithms and compares their performance based on accuracy and quality. In speech recognition DTW and HMM algorithms are compared with respect to accuracy. Comparative study of CELP and MBROLA algorithm of speech synthesis based on quality is also done.

National Blindness & Visual Impairment Survey India 2015-2019

This study examines the the 0-49-year-old population survey the sample size was estimated at 18,000 for the country. One district was chosen from each of the six zones of the country to ensure the heterogeneity of the sample population. A total of 3,000 individuals aged 0-49 years were enumerated in each district. In this survey, 30 clusters were selected randomly from each district, and 100 individuals were covered in each cluster.

**III. PROPOSED SYSTEM**

The integration of various platforms into a single application, such as Alan Studio, represents a significant advancement in empowering visually impaired individuals. By consolidating features like games, personality development tools, and community-based support systems, this unified platform offers users greater control over their digital experiences. Not only does it enhance accessibility, but it also fosters personal and professional growth within society.

In this comprehensive system, depicted in the Use Case Diagram (Fig. 1), users with visual impairments engage with various functionalities tailored to their needs. From signing up for accounts to creating profiles and joining communities, the platform ensures seamless interaction. Crucially, the system prioritizes accessibility by providing screen-reading capabilities and voice recognition, enabling users to navigate content effortlessly. Additionally, the incorporation of tests and certification mechanisms underscores a commitment to skills development and recognition.

The administrative component plays a pivotal role in platform management, encompassing tasks such as platform creation and course updates. This administrative oversight ensures the relevance and currency of available resources, enhancing the overall user experience. Moreover, the provision of expert teachers for visually impaired individuals not only facilitates learning but also promotes inclusivity within vocational training.

A noteworthy aspect of the proposed system is the accountability mechanism for trainers, who receive ratings based on performance. This feedback loop not only incentivizes excellence but also fosters a culture of continuous improvement. By leveraging technology and community support, the platform aims to create an inclusive environment conducive to the professional advancement of visually impaired individuals.

In conclusion, the integration of diverse functionalities within a unified platform represents a transformative step in enhancing the lives of visually impaired individuals. By prioritizing accessibility, skills development, and community engagement, this system has the potential to empower users, foster independence, and facilitate meaningful participation in society. Through ongoing innovation and collaboration, we can continue to build a more inclusive future for all.

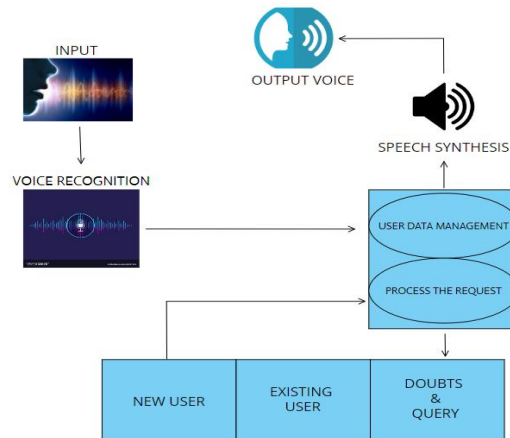


Figure 1: Work Plan

The activities and features of a system designed to support people with visual impairments are depicted in Fig. 1 Use case diagram. A variety of features and services are offered by the system to improve users' accessibility and independence in a range of areas. The figure shows the interactions between the users (those with visual impairments) and the system, as well as the external entities of the system and the use cases that reflect particular actions. The person with visual impairment can sign in/sign up for their account. They can create a profile and joins a community. They have the accessibility to edit their profile. The content on the screen will be read to the users. The requirements of the person will be satisfied by recognizing their voice and they will be able to access the content. Tests will be conducted and certificates will be provided for the course.

The admin is responsible for creating platforms and updating the courses.

The app provides expert teachers to train the visually impaired. The trainers will receive ratings based on which their performance will be valued. By implementing this proposed system, we can create a supportive and inclusive vocational training environment that empowers visually impaired individuals to pursue rewarding careers and achieve economic independence.

## IV. METHODOLOGY

### 4.1 SPEECH RECONITION

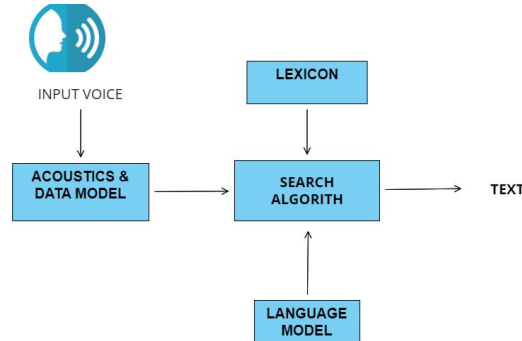


Fig. 2 Speech Recognition Architecture

#### Acoustic model

One of the most crucial knowledge bases for automatic speech recognition systems is the acoustic model. It identifies acoustic characteristics for phonetic units. The selection of fundamental modelling units is a key and significant issue in the construction of an acoustic model. Generally speaking, there are various sub word unit types that can be utilised for acoustic modelling when the target language of the speech is provided. The performance of the speech recognition system can vary significantly depending on the choice of acoustic modelling units. The process of creating statistical representations for the feature vector sequences calculated from the speech waveform is known as acoustic modelling of speech.

#### Decoder

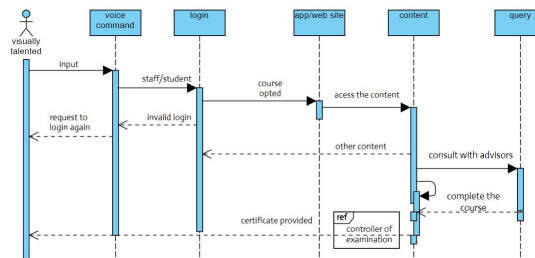
Finding the most likely word sequence  $W$  given the observation sequence  $O$  and the acoustic-phonetic-language model is the task at hand during the decoding step. Algorithms for dynamic programming can be used to tackle the decoding challenge. The emphasis is on identifying a single path through the network that best matches  $O$  rather than assessing the likelihoods of all potential model paths producing  $O$ . The Viterbi method is widely used to determine the ideal state sequence for a given observation sequence. It would be difficult to take into account every potential word during the recursive phase of the Viterbi algorithm for larger vocabulary recognition jobs. To solve this, a beam search for Viterbi iterations can be employed; only the words with path probabilities above a threshold will be considered. has superior generalization properties and uses less memory.

#### Language model

A language model is a collection of constraints on the sequence of words acceptable in a given language. These constraints can be represented, for example, by the rules of generative grammar or simply by statistics on each word pair estimated on a training corpus. Although there are words that have similar sounds, humans generally do not find it difficult to recognize them. This is mainly because they know the context and also have a fairly good idea about what words or phrases can occur in it. Providing this context to a speech recognition system is the purpose of a language model. The language model specifies what the valid words are in the language and in what sequence they can occur. Language models are usually trained, that is, the n-gram probabilities are estimated by observing sequences of words in corpora of text that contain, typically, millions of word tokens and by reducing perplexity on training data. It has been

observed, however, that reduced perplexity does not necessarily lead to better speech recognition results. Therefore, algorithms that improve a language model are a collection of constraints on the sequence of words acceptable in a given language. These constraints can be represented, for example, by the rules of generative grammar or simply by statistics on each word pair estimated on a training corpus. Although there are words that have similar sounds, humans generally do not find it difficult to recognize them. This is mainly because they know the context and also have a fairly good idea about what words or phrases can occur in it. Providing this context to a speech recognition system is the purpose of a language model.

**4.2 APPLICATION WORK FLOW**



The user first installs this app from the play store / App Store next, they need to sign in the using their google or apple mail id. Using the voice commands, they can perform these all actions.

The user chooses their field of interest and the app recommends the best and leading trainers from the app. user opt the courses and they complete the course in a period of time if they fell there are some issues related to the content the enquire their doubts with the advisor who are certified medical experts. the query will be solved and the content is been refined and thought to them with the help of trainers

After the completion of the course the user need to meet the level of the exam and they need to clear the exam so that they will be awarded with the certificate for the completion of the course

**V. MODULE DESCRIPTION**

**Visually Impaired Module**



Fig. 3 Visually Impaired Module

The user (Visually Impaired Person) can view the profiles of Trainers and Advisors. They can also update their profiles. The user can select courses and find their own teacher according to their ratings. According to their field of interest they join a community and grow their knowledge. After completion of course they attend the exams and get their certificates.

*Admin Module*

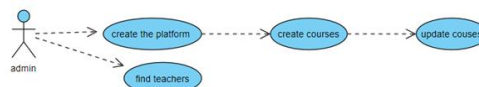


Fig. 4 Admin Module

The Admin user can view the profiles of users, advisor and trainers. They are super admin of the software. They control both backend and frontend.

**Advisor Module**

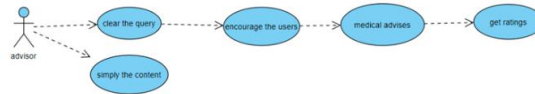


Fig. 5 Advisor Module

The Advisors are the medical certified doctors, who take care of users if they have physical or mental challenges during the duration of courses. They will give medical advises and clear their queries of the users. They also have rating which are given by the users.

**Trainer Module**

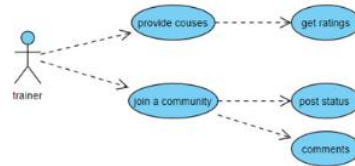


Fig. 6 Trainer Module

The Trainers are the ones who take creates the content. According to their weightage of content, they get their ratings from the users. They will train the users trainers have their own community for the betterment of the users. They post status and comments on each other.

**VI. RESULTS**

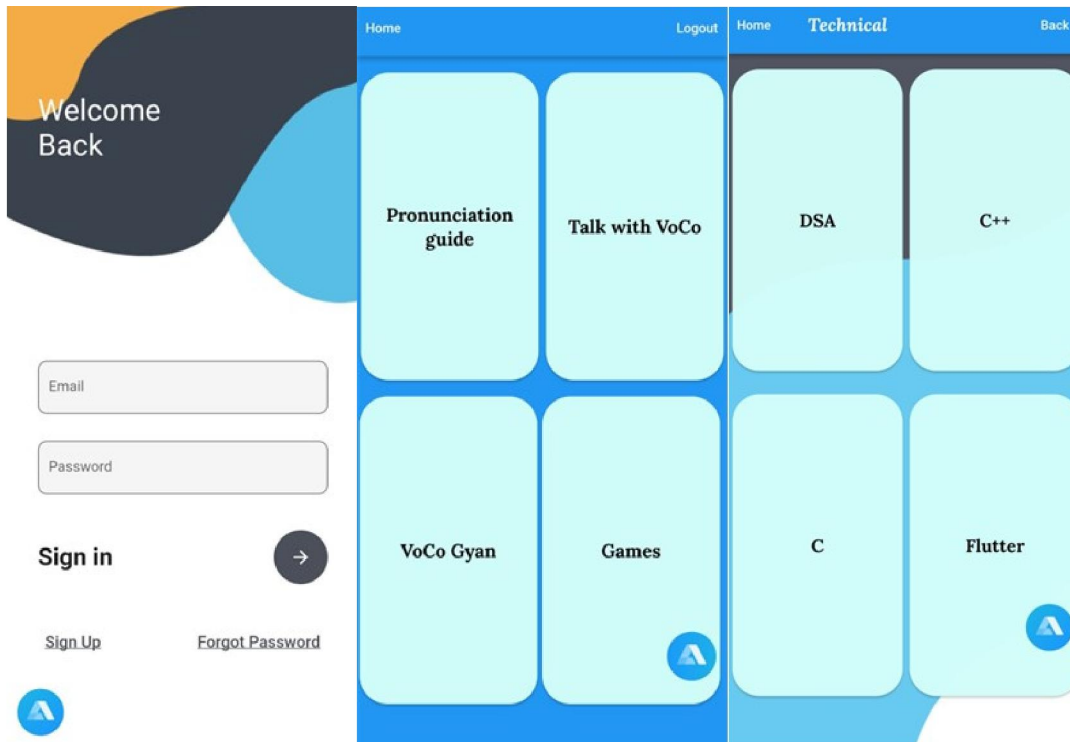


Fig. 7 Login Page

Fig. 8 Home Page

Fig. 9 Technical courses



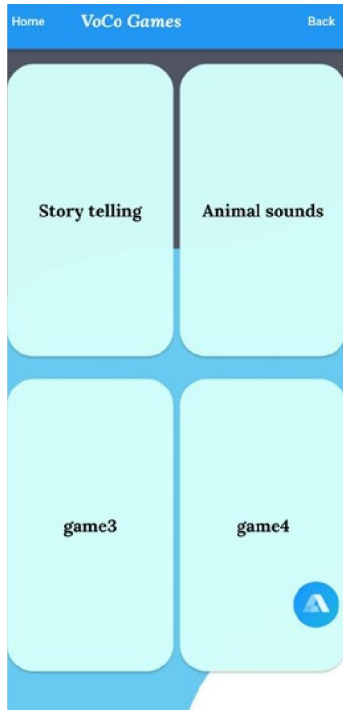


Fig. 10 Games

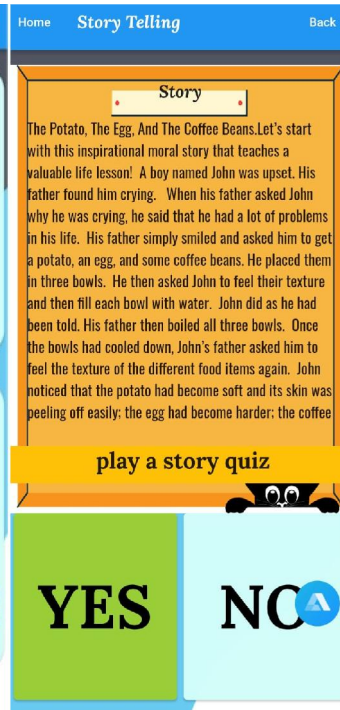


Fig. 11 Story Telling



Fig. 12 Talk with VoCo

## VII. CONCLUSION & FUTURE ENHANCEMENT

The app is primarily designed for visually impaired people to enhance their social and intellectual lives. Their lives will be changed by this, and they will have much hope that they can function as regular people in our community. One of the major issues facing society today is the lack of employment opportunities for people who are blind or visually impaired. It is a significant challenge to enable people to live independently without depending on others. Therefore, our app enables them to have access to technology so they can live independently. Our software offers employment opportunities for trainers who instruct people in need in addition to serving the needs of those who are visually impaired. Future development of this app could result in many different modules.

In the future enhancement the app may development of the controller of the examination which regulates the exam and enhance the content weightage and the model and high level of examination

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