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Domain: Software (Open Innovation)

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Problem Statement

Design a web app to eliminate communication barriers between speech and hearing-impaired individuals and non-impaired users. The app should provide real-time language translation, speech-to-text, text-to-speech, and sign language detection, ensuring accessibility in interviews and everyday interactions for a more inclusive and equal society.

Proposed Solution

An Application that offers seamless real-time language translation for wide range of users

- A Web App that uses AI, ML concepts for **Real-time** language translation, **Hand sign** detection, and communication between speech and hearing-impaired users.
- The application uses **Video Call (By creating a virtual room)** technique for hand sign detection.
- The web-app converts different languages as well as **Speech** to **Text** and **vice versa**, offers the hand Sign overlays.
- Communication becomes easy by translating between different languages, including for **candidates with impairments**.

Features and Innovations

Hand Sign Animated overlays for seamless Understanding :

For Sign Language Users and illiterate Users.

Real-time translation between wide variety of languages

Also Speech to Text and Vice-versa

Multiple Language Support

For reliable and easy Communication.

Interview rounds for Normal & Speech-impaired candidates during Recruitment

Will support wide range of candidates

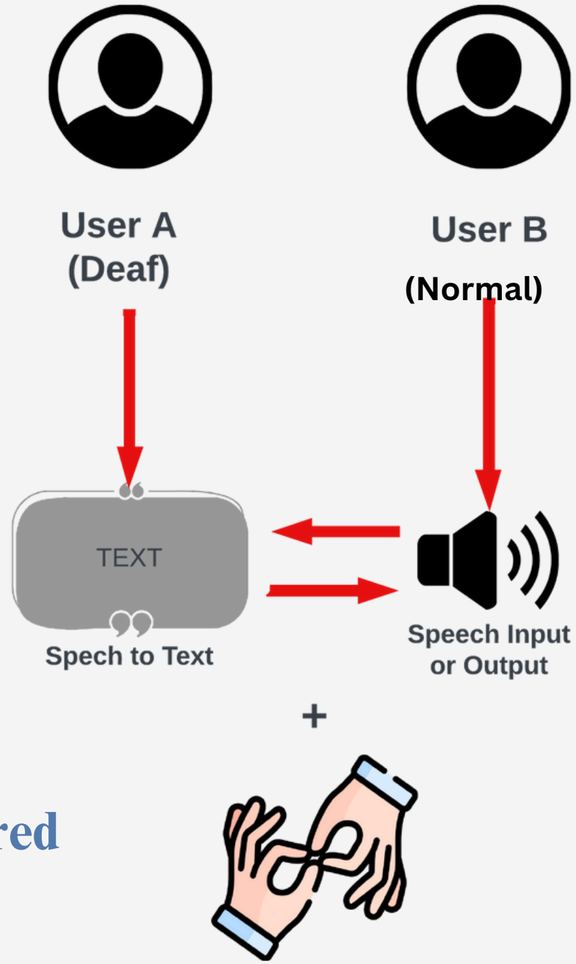

Fig .1: Diagrammatical of Echo assist.

Core Technologies

System Workflow

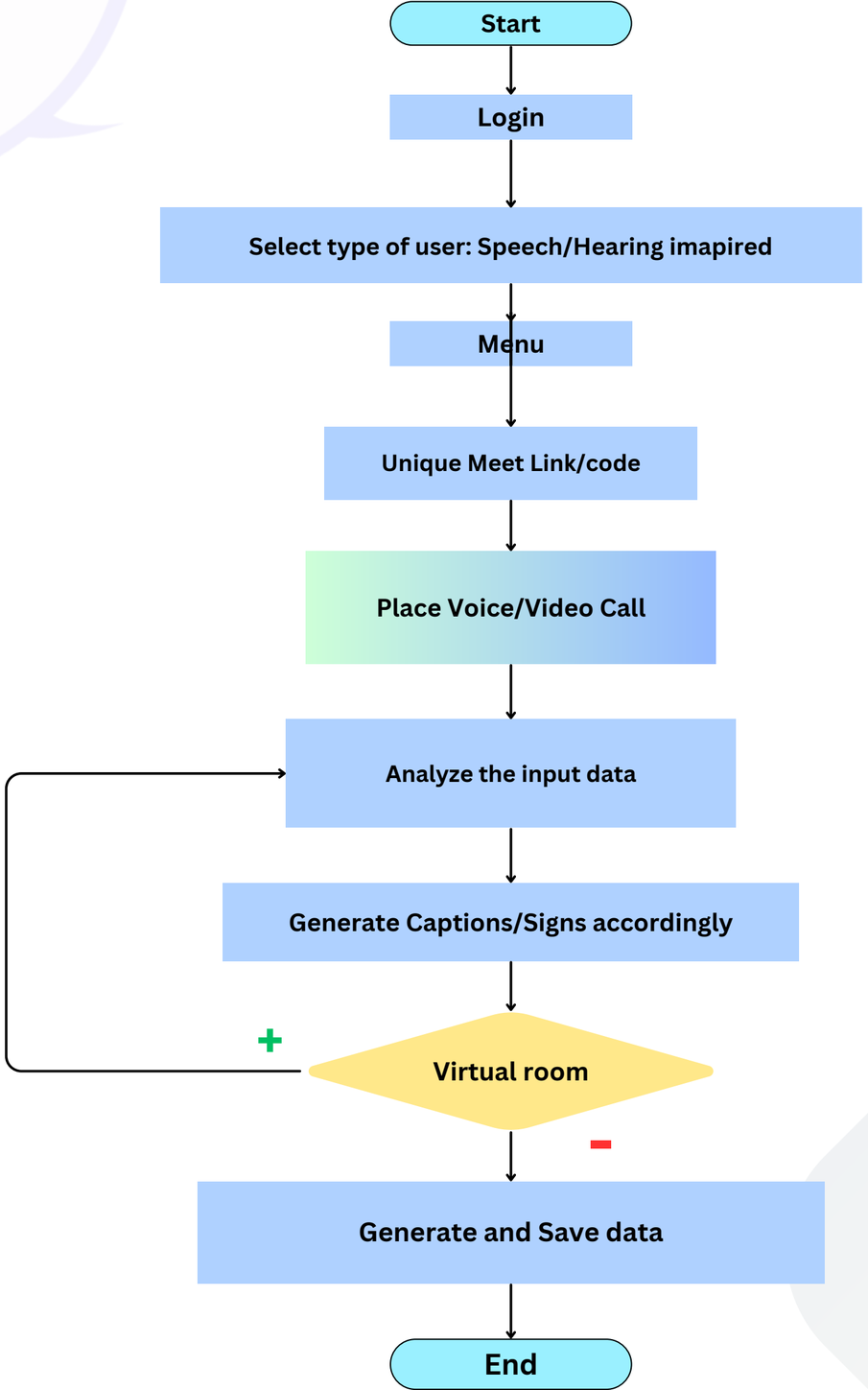

Fig.2 : Work flow of Echo assist

Methodology

- **AI Models:** Using Al image processing for translation and for transcribing video calls. **BERT** for Natural language processing & **CNN** for image classification.
- **Video/Voice call:** Integrating features with calling APIs like **WebRTC**.
- **Speech-Text Conversion:** **Google Text to Speech APIs** as affordable option.
- **Speech Translation:** Google Translate API for translating languages in real-time.
- **Interviewing Platform:** **Unique codes** for encryption, easy communication for speech/ hearing impaired candidates who seek jobs.

Impact and Benefits on Users

- Facilitation of **Employment** Opportunities.
- Support for **Sign Language** users as well as Normal Users can benefit wide range of people.
- Reduction of Communication **Barriers** as it supports **multiple language** translation.
- Increased **Social Inclusion**.
- **Psychological Benefits** like Confidence boosting and reduction in anxiety.
- Aids the complex **recruitment** process easier for Normal and even impaired candidates.
- Patients can communicate with **Doctors** in mother tongue which system translates in user specified language.
- **Government** can use this as a platform to connect with speech and hearing impaired laborers and farmers to address their problems online.

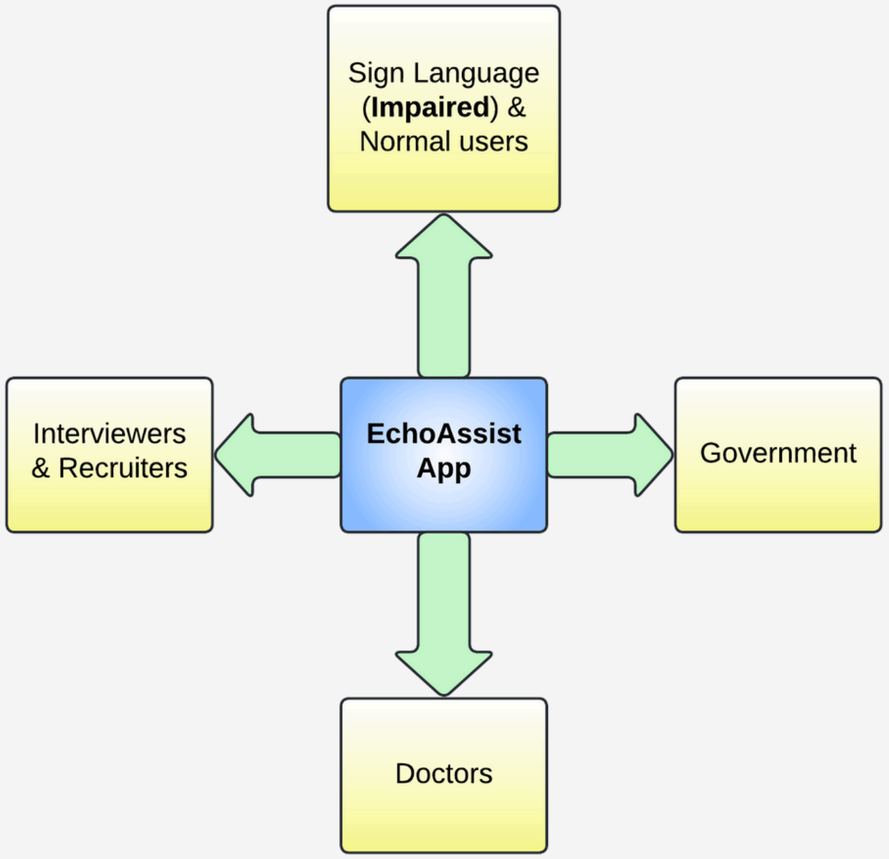

Fig : Applications

Future Scope and Conclusion

In conclusion, EchoAssist bridges communication gaps between speech and hearing-impaired individuals and others, fostering inclusivity through real-time language translation, AI-driven features, and seamless video call integration. It empowers users in everyday interactions and recruitment processes, ensuring accessibility and equal opportunities for all.