

A Project Report

On

**“Assistive Communication Web App”**

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5. **INTRODUCTION**

* Effective communication is essential for interaction in everyday life. However, individuals with speech and hearing impairments often face significant challenges.
* This presentation explores an assistive communication web app that integrates speech recognition, lip movement analysis, and sign language interpretation to enhance communication capabilities.

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**2. LITERATURE REVIEW**

**Existing Methods:**

* Speech Recognition Systems: Convert spoken words into text. High accuracy but may struggle in noisy environments.
* Lip Reading Technology: Analyzes lip movements. Limited by visibility and requires training.
* Sign Language Recognition: Captures gestures and translates them. Effective but limited by variations in sign languages.
* Text-to-Speech Systems: Converts written text back to speech. Useful for non-verbal users but lacks personalization.
* Augmentative and Alternative Communication (AAC) devices: Help users communicate via symbols or text. Hardware limitations can restrict usability.
* Voice-controlled Assistants: Enable interaction through voice commands. Limited to simple tasks.
* Mobile Applications: Some apps offer basic recognition capabilities but may lack integration.
* Gesture Recognition Systems: Recognize hand movements but can be affected by lighting and camera quality.

**Advantages and Limitations**

**Advantages:**

* Integrates multiple communication methods.
* Real-time processing capabilities.
* Enhances user independence.
* Customizable to user preferences.

**Limitations:**

* High resource demand for processing.
* Potential accuracy issues with background noise.
* User training may be necessary.
* Dependency on technology availability and connectivity.

**3. OBJECTIVES**

* To develop a user-friendly web application that supports speech, lip reading, and sign language.
* To achieve high accuracy in real-time communication.
* To provide customizable settings for diverse user needs.
* To ensure accessibility across various devices and platforms.

**4. EXPERIMENTAL DETAILS/METHDOLOGY**

**Hardwares and Softwares used:**

**Hardware Used:**

* Webcam for capturing lip movements.
* Microphone for voice input.
* Computer for processing data.

**Software Used:**

* Programming languages: HTML, CSS, JavaScript.
* Libraries: TensorFlow for machine learning, OpenCV for image processing.
* APIs for speech recognition and gesture analysis.

**5. METHODOLOGY**

**Design Procedure:**

* Input Processing: Capture speech and visual data.
* Feature Extraction: Analyze lip movements and extract speech features.
* Data Integration: Combine results from speech, lip reading, and sign language.
* Output Generation: Display text in real-time.

**6. OUTCOMES**

* A fully functional prototype of the web application.
* Enhanced communication capabilities for users with impairments.
* Positive user feedback to guide future improvements.
* Potential for wider implementation across assistive technologies.

**7. TIMELINE OF THE PROJECT/ PROJECT EXECUTION PLAN**

Phase 0: Requirements Gathering

This phase involves conducting surveys, interviews, and workshops to understand the needs of stakeholders and beneficiaries.

Phase 1: System Design & Development

This phase focuses on designing the software and hardware components of the system, Architecture and proposed method

Phase 2: Algorithm and Development

This phase involves 50% of implementation details with live demo of the project and 50% of report softcopy.

Phase 3: Monitoring and Evaluation

This phase involves continuous monitoring of the system's performance and collecting feedback from beneficiaries to identify areas for improvement.

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**8. CONCLUSION**

* The Assistive Communication Web App aims to bridge communication gaps faced by individuals with speech and hearing impairments.
* By integrating various modes of communication, it enhances accessibility and independence.
* Future work will focus on expanding functionalities and improving user experience.

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