WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Sign Language App

[1]Prof. Sangeeta Wankhade, [2]Bhumi Koli, [3]Atharv Varpe , [4]Rinku Solanki .

[1]Guide, [2,3,4]Group Members
CO, Vidyalankar Polytechnic, Mumbai

ABSTRACT:

SignifyMe: Real-Time ASL Translation for Inclusive Communication :

SignifyMe is an innovative app designed to bridge communication gaps for individuals with hearing or speech disabilities by translating American Sign Language (ASL) into text and speech in real-time. Leveraging computer vision and machine learning, the app captures hand gestures through the device's camera and converts them into meaningful words and sentences, enabling seamless interaction with non-signers. It integrates MediaPipe for precise hand tracking and TensorFlow for accurate gesture recognition, ensuring high translation accuracy. A unique feature allows users to input text, which is then translated into ASL signs through a 3D model created in Blender, facilitating two-way communication. Built with Flutter, SignifyMe offers a user-friendly interface, making it accessible for people of all ages, thereby promoting inclusivity in both social and professional settings.

SignifyMe benefits society by empowering individuals with hearing or speech disabilities through real-time ASL translation, enabling seamless communication without reliance on interpreters. It promotes inclusivity by bridging the gap between signers and non-signers, fostering accessibility in workplaces, education, and social settings. The app also enhances public services by improving communication in healthcare, customer support, and emergency situations. By facilitating effective interactions, SignifyMe expands employment opportunities for individuals with disabilities and helps businesses adopt inclusive communication practices. Ultimately, it strengthens social connections, reduces isolation, and contributes to a more accessible and inclusive society.

Introduction:

Signifyme is an innovative application designed to break down communication barriers for individuals with hearing or speech disabilities by translating sign language into both text and speech in real-time. By capturing hand gestures through a mobile device, the app allows individuals to communicate more easily with those unfamiliar with sign language, fostering better understanding and inclusivity.Additionally, it features a 3D model that performs ASL gestures when a user types a sentence, enabling those who do not know sign language to follow along and engage in conversations.

- Empowering Communication
- Promoting Inclusivity
- Enhancing Everyday Interactions
- Impact on Society
- Vision for Global Success

Main Features :

- Speech to Text – Converts spoken words into written text, allowing individuals with hearing impairments to read what is being said in real-time.
- Text to Speech – Transforms written text into spoken words, enabling individuals with speech impairments to communicate effectively.
- Live Translation – Provides real-time translation of American Sign Language (ASL) gestures into text or speech, making conversations seamless between signers and non-signers.
- Voice to Sign Language – Converts spoken words into corresponding ASL gestures using a 3D model, allowing better communication with individuals who rely on sign language.
- 3D Model for Sign Display – A virtual 3D avatar that demonstrates ASL signs, helping users learn and understand sign language visually.

- Text Input for Sign Generation – Allows users to type text, which is then translated into ASL signs using the 3D model, enabling communication from non-signers to sign language users.

These features work together to bridge the communication gap between sign language users and non-signers, promoting inclusivity and accessibility.

What is the SignifyMe?

In a world where millions of people rely on sign language to communicate, a significant communication gap still exists between signers and non-signers. Without accessible tools, individuals with hearing or speech disabilities face difficulties in interacting in social, educational, and professional environments.

Signifyme meets this critical need by providing :-

- A real-time solution that bridges this communication between individuals .
- Ensures that everyone, regardless of their ability, has a voice that can be heard.
- The 3D model feature further enhances accessibility by allowing non-signers to visualize the ASL gestures, making interactions smoother and more effective.
- By addressing this vital need, Signifyme ensures that individuals with disabilities are not left out in any sphere of life, making communication more accessible and inclusive for all.

Methodology:

The methodology employed in developing, Sign language App encompasses thorough research, iterative design processes, and agile development methodologies, ensuring the seamless integration of modules and the implementation of user-centric features to meet the diverse needs of educational stakeholders. The development of the **Sign Language App** follows a research-driven, iterative design process combined with **Agile Development** to ensure seamless module integration and user-centric features tailored to diverse educational needs.

Agile Development Method:

Agile is a flexible and iterative approach to software development that is well-suited to projects with evolving requirements and a need for continuous adaptation. Agile, work is typically divided into small, manageable units known as sprints. Each sprint delivers a potentially shippable product increment.

This approach allows you to prioritize and develop modules incrementally, making it easier to adjust to changing needs and add new modules as required. As shown in the figure, every module has been planned, designed, coded, tested and then launched again the same process is repeated for other module.

Who does it? Software Engineers and other project stakeholders (managers, customers, end users) work together on an agile team – a team that is self - organizing and in control of its own destiny. An agile team fosters communication and collaboration among all who serve on it.

How it used in our project? The basic framework activities – communication, planning, modeling, construction and deployment – remains. But they are morph into a minimal task set that pushes us towards construction and delivery.

How Does Agile Development work?

In practice, Agile works by establishing cross-functional teams that work closely together throughout the development process. These teams collaborate on defining requirements, planning iterations, and reviewing progress. Each iteration typically lasts from one to four weeks and results in a potentially shippable product increment. At the end of each iteration, stakeholders provide feedback, allowing for adjustments to be made in subsequent iterations. This iterative approach enables rapid delivery of value, reduces the risk of project failure, and fosters a culture of continuous improvement.

Typical work activities in Agile development include:

- Sprint Planning: Collaboratively defining the goals and tasks for each iteration (sprint) with the team. Daily Stand-ups: Brief meetings where team members discuss progress, plans, and any obstacles.
- Iterative Development: Building and testing software in short cycles, typically lasting one to four weeks.
- Continuous Integration: Frequently integrating code changes into a shared repository to detect and address issues early. Retrospectives: Regular meetings to reflect on the team's processes and identify areas for improvement.
- Stakeholder Collaboration: Engaging with customers and end-users to gather feedback and refine requirements. User Story Refinement: Breaking down features into smaller, actionable tasks (user stories) that deliver value.
- Testing and Quality Assurance: Conducting automated and manual tests to ensure the software meets quality standards.

The following methodologies collectively contribute to the successful design and implementation of Sign language App creation, enabling you to deliver a user-friendly, efficient, and feature-rich educational platform:

1. Agile Development: By breaking down tasks into manageable iterations and emphasizing collaboration and adaptability, you've likely embraced Agile principles to facilitate the development process.
2. User-Centered Design (UCD): Considering the needs and preferences of teachers, parents, administrators, and students suggests that you've incorporated UCD principles to ensure that the platform meets the requirements and expectations of its users.
3. Iterative Development: The continuous refinement of features and functionalities, as well as the emphasis on feedback loops, indicates that you've adopted an iterative approach to development, allowing for incremental improvements over time.
4. Prototyping: Creating prototypes or mockups of the platform's interface and functionalities may have been part of your design process to visualize and refine the user experience before full-scale implementation.
5. Requirement Analysis: Conducting thorough analysis and gathering requirements from stakeholders, such as teachers, parents, administrators, and students, suggests that you've followed a structured approach to ensure that the project aligns with user needs and organizational goals.

Objective:

1. **Streamlining Administrative Tasks:** To simplify and automate various administrative processes such as examination management, attendance tracking, classroom allocation, and campus navigation to save time and resources.
2. **Enhancing User Experience**: To provide teachers, parents, administrators, and students with a user-friendly platform that offers personalized dashboards, easy access to information, and seamless navigation.
3. **Prioritizing User Security and Privacy:** To ensure the security and privacy of user data by implementing robust authentication mechanisms, encryption protocols, and access controls.
4. **Promoting Engagement and Accountability:** To encourage student and parent engagement in the educational process by providing tools for monitoring attendance, tracking academic progress, and facilitating communication with teachers and administrators.
5. **Innovating Educational Technology:** To leverage advanced features such as detailed campus maps, emergency exit routes, and seamless examination and attendance modules to set a new standard in educational technology and enhance the overall learning experience.

Advantages:

1. **Accessibility & Inclusivity :** Real-time Sign-to-Text Translation – Helps bridge communication gaps between the deaf and hearing communities. Text-to-Speech Feature – Converts translated text into speech, aiding those with hearing impairments.
2. **Advanced Technology & Accuracy :** AI-Powered Sign Recognition – Uses MediaPipe & TensorFlow for accurate hand tracking and gesture detection. Continuous Learning – The app improves accuracy over time with AI-based model updates.
3. **Strengthens Social Connections** – Reduces isolation by enabling meaningful interactions between signers and non-signers.
4. **Enhances Learning and Awareness** – Helps non-signers learn sign language, spreading awareness and encouraging more people to communicate using ASL.
5. **Supports Multimodal Communication** – Integrates speech-to-text, text-to-speech, and sign language translation for diverse communication needs.

Results:

Agile in Our Project

Our team—comprising **software engineers, designers, and stakeholders (managers, users, educators)**—collaborates in an **agile environment** that fosters communication and adaptability. While the core framework activities remain (communication, planning, modeling, development, deployment), they are streamlined for **rapid iteration and continuous delivery**.

How Agile Works in Practice

Agile development involves cross-functional teams working in short iterations (1-4 weeks). Each iteration results in a working product increment, reviewed by stakeholders for feedback. This process:

✔ Ensures rapid delivery of value.

✔ Reduces project risks by addressing issues early.

✔ Promotes continuous improvement through iterative refinements.

By following Agile, the Sign Language App evolves dynamically, ensuring an efficient, user-centric, and adaptable solution. 🚀

OUTPUTS:

FRONT PAGE

SIGN UP

SIGN IN

CAMERA

3D-MODEL

OPTIONS

SETTINGS

ACCOUNT

PROFILE

HISTORY

SAVED

CHANGE PASSWORD

FAQ'S

REPORT A PROBLEM