TED UNIVERSITY

Faculty of Engineering

Department of Computer Engineering

CMPE 491 – Project Specifications Report

by

Özge Sena Karabıyık - 64303375180

Kerem Irmak - 32813381526

Deniz Yardımcı - 10058882046

Mehmet Alperen Keser - 14888621660

Submission Date

29 October 2023

Table of Contents

1. Introduction

1.1. Description

In a world where effective communication is essential, we recognize that one significant obstacle lies in the lack of mutual understanding between different groups due to language barriers. The main purpose of the SignLinga project is to serve as a bridge between people who can speak sign language and those who cannot, by working as translator and to contribute to the world under the title of "Barrier-Free Life". We are developing a mobile application in the SignLinga project to remove barriers between these two user groups. In this regard, the scope of the application includes translating sign language into text by using real-time video analysis to ensure seamless communication, translating written text into sign language for mutual communication, and translating spoken language into sign language via a microphone for faster communication.

1.2. Constraints

1.2.1. Economic

The SignLinga project is cost-effective since it is a software-based project and does not require expensive hardware materials. This economic viewpoint is in harmony with our mission of 'Barrier-Free Life' by bring about wide accessibility. SignLinga's focus on cost-effectiveness underscores the issue of removing barriers, helping hearing-impaired individuals communicate without worrying about finances.

1.2.2. Environmental

SignLinga is largely environmentally friendly as it is software-focused and does not contain extra hardware components. By addressing this, we aim to develop and maintain the project in an environmentally friendly way that does not affect the environment.

1.2.3. Social

SignLinga aims to strengthen social connections by facilitating communication between individuals who use sign language and those who do not. In addition to the effective communication established through the application, the learning environment is also created. SignLinga can be an effective tool for any individual who wants to learn sign language. The application will make communication accessible to all individuals of society and contribute to a more harmonious society.

1.2.4. Political

SignLinga does not involves any political constraints.

1.2.5. Ethical

Our commitment to ethical standards is crucial. Developers will stick to these standards throughout and after the development process. This includes a focus on data security, user consent, and ethical considerations in the use of technology to ensure a responsible project.

1.2.6. Health and Safety

Due to its design, SignLinga does not cause any health or safety problems. User satisfaction is important, which is why SignLinga was designed to create a safe and supportive environment for all users.

1.2.7. Sustainability

The sustainability and continued functionality of SignLinga is ensured by adaptation to new technologies and periodic system software updates that will improve user experiences. In this way, it is aimed to develop an effective and permanent resource for the society.

1.2.8. Manufacturability

Considering that SignLinga is a software development program, physical manufacturing constraints are minimal. For the same reason, SignLinga is advantageous in other manufacturing areas including educational software, assistive technology applications, and communication software development.

1.2.9. Professional and Ethical Issues

1. Prioritize user safety.
2. Safeguard user privacy.
3. Get consent from users regarding data usage.
4. Maintain trustworthiness and honesty.
5. Pursue excellence in both processes and products.
6. Ensure software specifications meet user needs and receive proper approvals.
7. Ensure that the application is improved to meet user expectations.
8. Adhere to professional guidelines and regulations.
9. Advocate for and uphold the principles of our code.
10. Avoid reusing copyrighted code without the necessary licensing or permissions.

2. Requirements

2.1. Admin Panel System Requirements

2.1.1. User Authentication and Management

- Must be able to complete the admin login process with password and email.
- Must be able to define and manage user roles (e.g., admin, moderator, regular user, etc.)
- Must be able to search among the users who are listed as users of program.
- Must have the ability to deactivate users and identify which ones are disabled.

2.1.2. Notification Management

- Must be able to send notifications when entering the author, date, image, description, notification status and notification title.
- Must be able to guarantee that the user may log out.

2.2. Sign Linga System Requirements

2.2.1. Sign Language Translation
- Must be analyze the body movements of people using sign language from the camera image and convert them into text.
- Must be able to listen to the text translated from sign language aloud whenever they want.
- Must be able to translate the text written by users who do not know sign language into sign language.
- Must be able to make microphone-to-sign language translation for users who do not want to type text.

2.2.2. User Management
- Must be able to have an ability for users to log into the application with their email and password.
- Must create user profiles where users can view and edit their personal information.
- Must be able to have an ability to register users by entering their name, email, and password.
- Must be able to have an ability to verify user identity using OTP code from users.
- Must send user-friendly error messages to guide users when issues occur.

3. References

[1] ACM. (n.d.). Code of ethics and professional conduct. Retrieved from [https://www.acm.org/code-of-ethics]

[2] Cambridge, D. B. M. R. (n.d.). Sign Language Recognition, Generation, and Translation | Proceedings of the 21st International ACM SIGACCESS Conference on Computers and Accessibility. ACM Conferences. [https://dl.acm.org/doi/abs/10.1145/3308561.3353774]

[3] R. Harini, R. Janani, S. Keerthana, S. Madhubala, S. Venkatasubramanian, Sign Language Translation. In 2020 IEEE International Conference on Computing (ICCP), [https://doi.org/10.1109/ICC.2020.9074370]