



First semester 2024/2025
Human-Computer Interaction & User Interface Design (10672332)
Homework Assignment # 1
Stage one: Research

12220444: جهاد جبريل عادل اشتية

Dr. Mustafa Assaf

12112494: نجوى محمود عوض ياسين

12218765: محمد سامر مكاوي

12216913: نصار محمد الحاج

1. Define the Topic

Description

Sign Connect is an innovative platform designed to bridge communication gaps for the deaf and mute community. Combining real-time sign language translation, 3D interactive learning modules, and multi-language support, the app empowers users to communicate effectively while offering an educational space to learn and master sign languages. The platform serves as an all-in-one solution for communication, translation, and education, offering the following key features:

1. Text and Voice-to-Sign Language Translation:

- Users can input text or speak into the app, which translates the content into animated sign language gestures, facilitating effective communication for non-signers.

2. Sign Language-to-Text Translation:

- Through a built-in camera, the app captures sign language gestures from users and translates them into text, making communication seamless for non-signers.

3. Learning Module:

- A robust suite for learning sign language, featuring:
 - Alphabet-to-sign mapping.
 - Translation of commonly used words and phrases (e.g., greetings like "hello").
 - Interactive courses and educational videos conducted by professional instructors.
-

What problem does it aim to solve

- Communication barriers for deaf and mute individuals
 - Limited educational resources for sign language
 - Social isolation
-

Who Will Use It

1. **Non-signers:** People who lack knowledge of sign language but wish to communicate effectively with those who rely on it.
 2. **People with Disabilities (Deaf and Mute):** Users who need a tool to bridge the communication gap with non-signers.
 3. **Sign Language Learners:** Individuals interested in learning sign language for personal, social, or professional purposes.
-

Project Main Objective:

To create an innovative digital platform that bridges communication gaps for deaf and mute individuals by:

- Providing real-time sign language translation
- Developing comprehensive learning tools
- Creating a powerful mechanism to raise societal awareness about the challenges and unique perspectives of the deaf community

What We Hope to Achieve with it :

- Improve user productivity
 - Reduce communication barriers
 - Enhance social inclusion
 - Provide educational opportunities
 - Increase overall customer satisfaction for deaf and mute users through a technologically advanced, user-friendly communication solution
-

2. Conduct Research

1- Primary Research: The primary research involved conducting a questionnaire to gather insights from potential users, including deaf and mute individuals, general users, and professionals. This helped identify key challenges in communication and sign language learning, such as social isolation and lack of resources. The findings emphasized the need for features like instant translation, 3D models, and educational tools, providing valuable guidance for designing an inclusive and impactful solution.

[Survey link](#)

2-Secondary Research:

Opportunities for Differentiation

- **Broader Language Coverage:** Addressing the gap by supporting sign languages specific to diverse regions and languages (e.g., Arabic, Asian languages).
- **Integrated Features:** Combining both translation and interactive education to cater to a wider audience (e.g., non-signers, individuals with disabilities).
- **Accessibility for All:** Offering free or affordable services to promote inclusivity while maintaining advanced features.
- **Real-Time Cross-Communication:** Focusing on seamless two-way communication, including voice-to-sign and sign-to-text translation.

Strengths of Competitors:

- Simple and user-friendly interfaces make tools accessible to a wide range of users.
- Good translation accuracy for specific sign languages, especially for commonly used ones such as American and European sign languages.
- Some solutions offer interactive lessons, structured courses, and educational videos for learning sign language.
- Free or affordable basic services provide entry-level accessibility for users.
- Support for instant translation enhances real-time communication.

Weaknesses of Competitors:

- Limited language coverage, with most tools focusing on a small set of sign languages, leaving other regions and languages underserved.
- Some tools lack modern or visually appealing interfaces, reducing user engagement.

Translation accuracy is inconsistent and requires improvement in certain cases.

- Advanced educational features are either absent or underdeveloped in some tools.
- Paid subscription models can be a barrier for users seeking comprehensive features.

Example Competitors:

-[SignAll](#)


-[HandTalk](#)

-[ProDeaf](#)

-[SignLanguage ai](#)


3. Define User Personas

Ahmad Al-Khatib



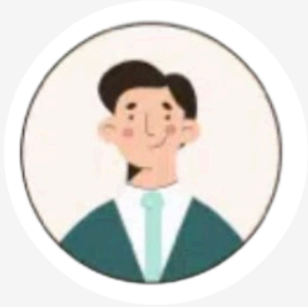
Ahmad Al-Khatib

Age 32
Occupation University Student
Location Gaza



Background	Goals	Narrative
<p>Student</p> <p>Studying computer science, interested in tech innovations, lives in Gaza.</p>	<p>Access affordable online courses and better internet connectivity</p>	<p>Ahmad is a dedicated student who dreams of becoming a software developer. Despite challenges, he seeks innovative solutions to continue his education and improve his skills in technology.</p>
Challenges	How the Product Can Help	
<p>Frequent power outages disrupt studies.</p>	<p>Provide offline access to educational materials, power-efficient apps, and mentorship forums.</p>	
Frustrations	behavior	
<p>Limited access to technology and stable eletricity.</p>	<p>Frequently visits internet cafes; eager to learn via online resources.</p>	

Tamer Najjar



Tamer Najjar

Age 18

Occupation High School Student

Location Gaza

Goals

Access scholarships and global learning opportunities.

Challenges

Navigating international applications without mentorship.

Background

Excels in math and science, dreams of studying abroad, lives in Gaza.

Frustrations

Restricted travel and lack of guidance on international programs.

How the Product Can Help

Provide scholarship matching tools, application resources, and online mentorship programs.

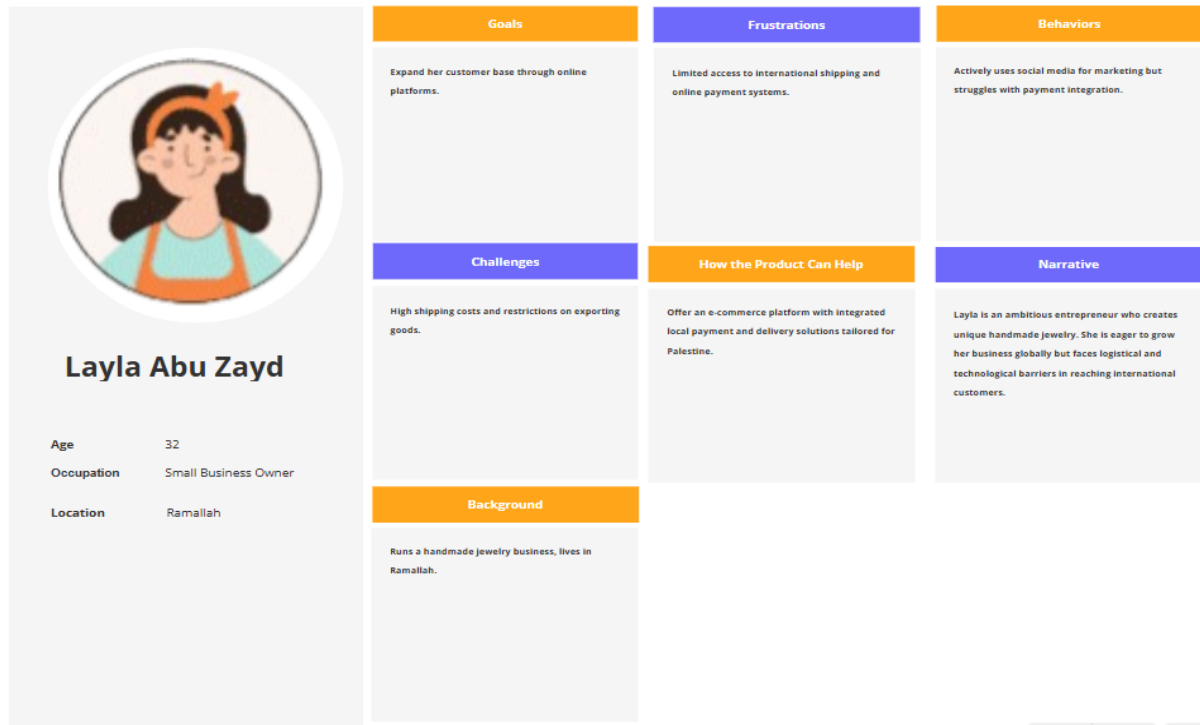
Behaviors

Diligent and participates in online competitions to build his resume.

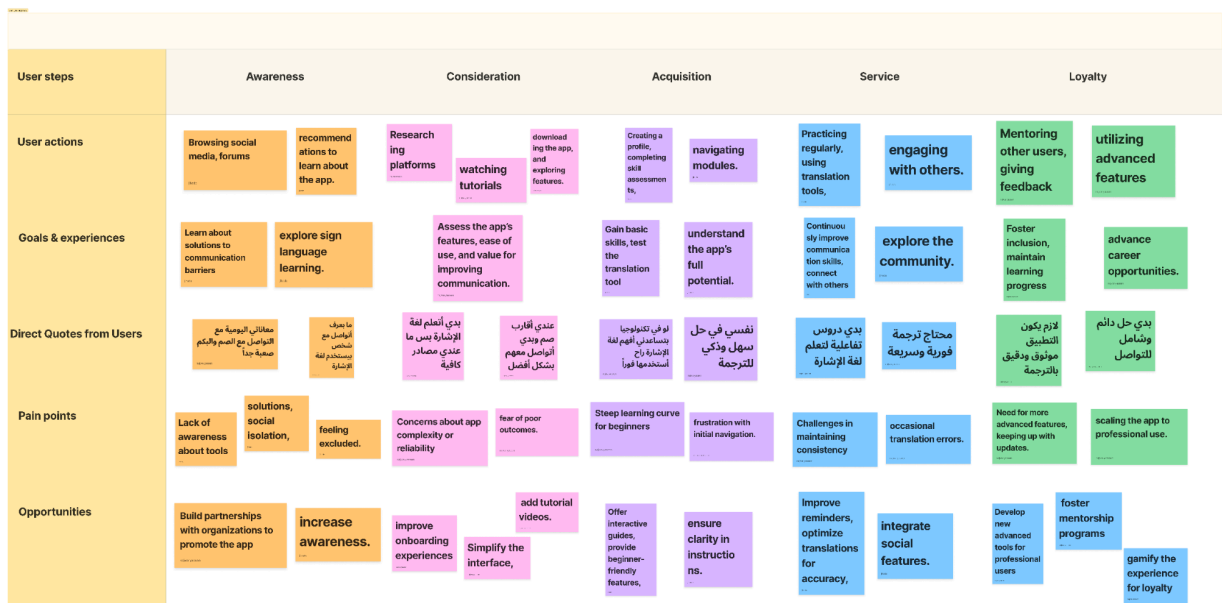
Narrative

Tamer is a bright student with aspirations to study in prestigious universities abroad. He actively seeks opportunities to stand out academically despite the constraints of his environment.

Layla Abu Zayd



4. Build an Experience Map



5. Dot Voting

Pain Points:	Nassar	Jihad	Mohammad	Najwa	Total
Lack of awareness about solutions, feeling isolated	1	1	0	1	3
Technical complexity, uncertainty about effectiveness.	1	1	0	2	4
Learning curve, frustration with initial use.	1	1	2	0	4
Consistency challenges, translation limitations.	0	2	3	0	5
Poor accuracy in understanding sign language	2	0	0	3	5

6. Goals Based on Critical Pain Points

1. **Goal:** Enhance Translation Consistency and Accuracy

Pain Point Addressed: Consistency challenges, translation limitations.

User Benefit: The app will provide more reliable and consistent translations, reducing errors and improving the quality of communication between users, leading to a better learning and interaction experience.

2. **Goal:** Improve Sign Language Recognition and Understanding

Pain Point Addressed: Poor accuracy in understanding sign language.

User Benefit: Users will benefit from better recognition and understanding of sign language through improved algorithms and more accurate translations, enhancing their learning and communication skills.

7. Goals and matrices

Goal	Metric	Current Baseline	Target	Measurement Method	Frequency of Measurement
Enhance Translation Consistency and Accuracy					
Translation Accuracy Rate	To be established	75%	90%	Blind testing with native sign language users	Quarterly
User Translation Confidence Score	3.5/5	3.5/5	4.5/5	In-app user feedback after each translation	Continuous
Error Reduction	Baseline error rate to be determined	Current error rate	60% reduction	Automated error logging	Monthly
User Satisfaction with Translations	70% satisfied	70%	85% 'Very Satisfied' or 'Excellent'	Quarterly user surveys	Quarterly

Goal	Metric	Current Baseline	Target	Measurement Method	Frequency of Measurement
Improve Sign Language Recognition and Understanding					
Sign Language Recognition Accuracy	To be established	70%	85%	Controlled testing with expert interpreters	Bi-annually
Learning Curve Efficiency	Current learning time baseline	Current duration	40% reduction in learning time	Tracked user progression times	Quarterly
User Performance Improvement	Initial proficiency level	Initial baseline	Significant skill development progression	Progressive scoring system	Monthly
Accessibility Impact	Current communication success rate	Baseline to be determined	50% improvement in communication effectiveness	User experience surveys and interaction tracking	Quarterly



First semester 2024/2025

Human-Computer Interaction & User Interface Design (10672332)

Homework Assignment # 2

Stage two: Conceptualization

ETA: 30 December 2024 midnight.

Dr. Mustafa Assaf

جهاد جبريل عادل اشتية : 12220444

نجوى محمود عوض ياسين : 12112494

محمد سامر مكاوي : 12218765

نصار محمد الحاج : 12216913

1. Content Inventory Document :

1. Authentication & Onboarding

- Welcome Screen
 - Logo and app name
 - "I am Deaf/Mute" button
 - "I want to Learn" button
 - "Get Started" button
 - Justification: Addresses pain point of user isolation by providing clear entry points for different user types
- Account Management
 - Login screen
 - Registration form
 - Language selection

- Profile settings
- Justification: Enables personalized experience and accessibility preferences

2. Translation Features

- Real-time Translation Interface
 - Camera view
 - Microphone input
 - Text input field
 - Sign-to-Text toggle
 - Text-to-Sign toggle
 - Position guide
 - Translation results display
 - Justification: Addresses core pain point of communication barriers and poor accuracy in understanding sign language

3. Learning Module

- Learning Journey
 - Progress tracking
 - Current level indicator
 - Learning paths:
 - Basic Communication
 - Professional Skills
 - Cultural Exchange
 - Recommended lessons
 - Daily challenges
 - Practice timer
 - Justification: Addresses pain points of learning curve and technical complexity

4. Community Features

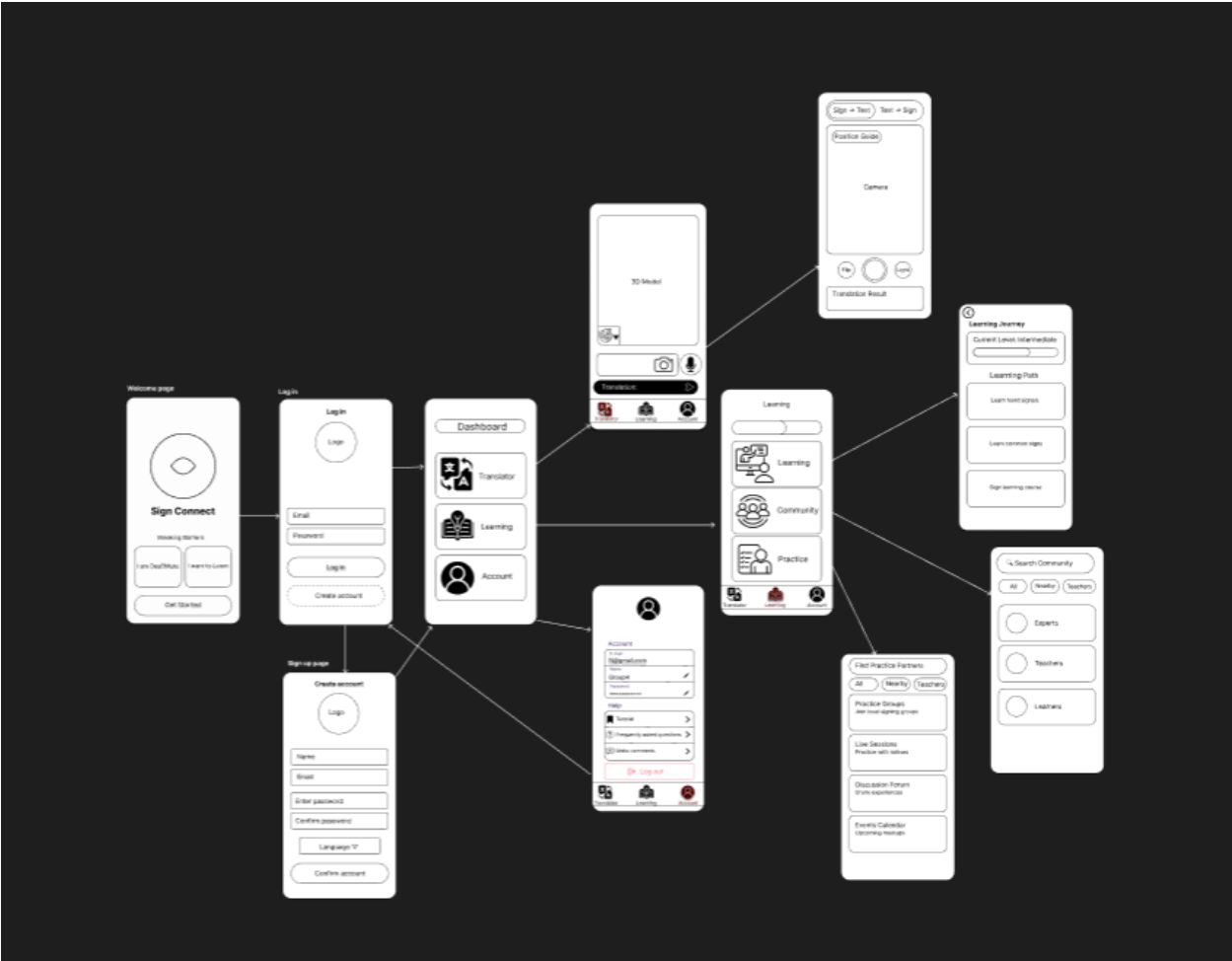
- Practice Partners
 - Search functionality
 - Filtering options (All/Nearby/Teachers)
 - Practice groups

- Live sessions
- Discussion forum
- Events calendar
- Justification: Addresses isolation pain point and enables social learning

5. Support & Help

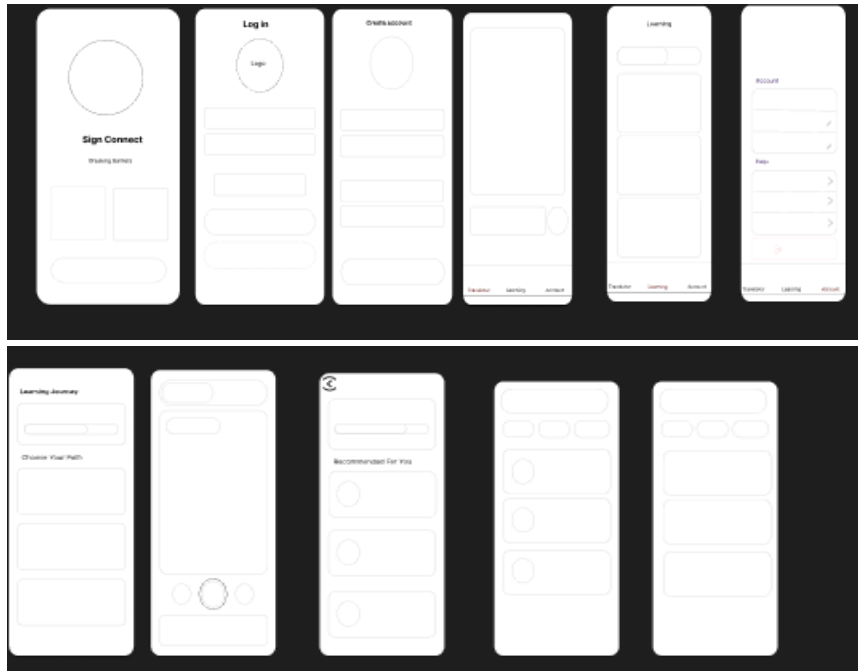
- Tutorial section
 - FAQ section
 - Help documentation
 - Feedback system
 - Justification: Addresses pain point of technical complexity and uncertainty
-

2. Flow Map : [Flow Map link](#)



4. Paper Prototype : Important Note This is an electronic version. The main version will be submitted and presented with the presentation in tomorrow's lecture, December 31, 2024.

Figma link : [Paper Prototype](#)



5. Class Demo : [our presentation link](#)