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Foundation Certificate for Higher Education

Module: DOC 330: Designing Innovative Solutions

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Group ME3.

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Abstract

In a world marked by diverse languages and communication barriers, our vision is to bridge the gap between the hearing and the deaf communities through an innovative mobile application. This app serves as a universal translator for sign language, empowering users to seamlessly convert signed gestures into any spoken language and vice versa. By providing a platform where both deaf individuals and those unfamiliar with sign language can communicate effortlessly, we aim to foster inclusivity, understanding, and meaningful connections across linguistic divides. Our mission is to break down communication barriers, ensuring that everyone, regardless of their ability to hear, can engage in a rich and accessible global conversation.

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Abbreviations

1. NAD - National Association of Deaf
2. RID - Registry of Interpreters for the Deaf
3. U.S. – United States

1. Introduction

Where communication gaps persist, particularly for those who use sign language, a groundbreaking initiative is underway. The aim is to develop an app that seamlessly translates sign language, fostering a bridge between the deaf community and the wider world. This visionary project intersects several key industries. Organizations like NAD advocate for the deaf and hard of hearing, emphasizing the importance of inclusive communication. RID is the pivotal role of professional interpreters.

Many other apps that contain sign-language have features like translating text into sign language, real life situation signs and many more but there are also some things that are missing which, when someone shows a video transcript it cannot be changed into sign language.

The solution to this problem is to upgrade these applications by adding new features that can solve these problems. Which is, translate the video transcript into sign-language, translate the sign language into words real-time through camera and alert feature (vibration) if someone calls their name or specific thing etc.

Creating an app that bridges the communication gap between deaf individuals and those who don't know sign language is both innovative and inclusive. This app has the potential to break down communication barriers between deaf individuals. This has the power to foster empathy by allowing non-sign language users to understand the challenges faced by the deaf community. Including learning modules for both sign language and spoken language can contribute to raising awareness about the importance of communication accessibility. Furthermore, creating a community within the app where users can share their success stories, tips, and experiences. Building a supportive community adds value to the overall user experience is the main goal.

To challenge communication barriers, particularly for those utilizing sign language, the goal is to develop a groundbreaking app that facilitates seamless translation between sign language and spoken languages. Innovative solution aims to empower both the deaf community and individuals who cannot speak.

2. Problem specification

2.1. Actual situation

Special needs people who are nonverbal and deaf are currently facing many problems when trying to use many essential public services such as hospital services, banking services, and grocery store services. Within the subset of the U.S. population that uses English as a second language, deaf individuals may be at greatest risk for poor physician-patient communication (Culver, 1988). The problem is that most of the employees are unaware of communicating in sign language. Misunderstandings of the communication needs of deafblind people can lead to them being erroneously labelled as cognitively impaired (Bodsworth, 2011) This leads to many issues that make it difficult for them to get the services they require. This problem is very frustrating and makes it more difficult for them to get the same services as everyone else. Communication barriers may lead to family and friends becoming frustrated and the deafened person feeling vulnerable and isolated, not knowing what is happening and withdrawing from social activity (Fergusson, 2003). In addition to compromising their access to necessary services, ignoring the situation raises questions about unfairness and discrimination.

2.2. Ideal situation

In society, everyone, including the deaf and nonverbal people, should have easy access to essential public services. For that employees who work at hospitals, banks, and grocery stores would be very proficient in sign language. They would have all the expertise in information and tools that are necessary to assist everyone. This will build an environment that is friendly and welcoming, by allowing everyone including deaf and nonverbal people to easily access the essential public services and guaranteeing that everyone's needs are fulfilled.

2.3. Gap

Special needs individuals who are deaf and nonverbal face significant barriers when attempting to access essential public services. The United States Census Bureau estimates that there are nearly 11 million people who are deaf in the United States (Mitchell, 2006). Throughout history, deaf individuals have faced many challenges in using sign language due to hearing people's exclusionary practices (Greenwald, 2015). Communication barriers stem from limited understanding of sign language and alternative communication methods by service providers who restrict their ability to receive healthcare, conduct financial transactions, and purchase groceries. Hearing workers generally lack training opportunities to learn about Deaf culture and the Deaf community and are often unfamiliar with the legal requirements for accommodating deaf clients (Zazove, 2005).

2.4. Root courses

Clearly define the app's major aims and features, with a focus on bridging communication gaps and building empathy. Then determine critical elements such as translation, sign language and spoken language learning modules, and community sharing functionalities. Develop interactive prototypes to visualize and test user interactions, seek feedback for improvements and select appropriate technology stacks and tools for app development. Create educational content that emphasizes accessibility and inclusion. Install community forums, chat features, and discussion boards to allow people to share their experiences, tips, and success stories. Make a supportive and encouraging environment a priority. Release the app on relevant platforms after refining based on user feedback and testing result.

2.5. Stakeholders

a. Deaf and Nonverbal Individuals: Face challenges when communicating whilst service providers do not understand sign language.
b. Healthcare professionals: Encounter challenges in communicating with them without sign language proficiency.
c. Policy Makers and Government: Face challenges such as limited resources, complex legislation, collaborating with stakeholders, and creating policies that are inclusive of the deaf and nonverbal community.

2.6. Gap analysis

Features	Similar Apps & Websites						Proper solution
	Hastha	Conversations – Sinhala	Deaftawk	Alphabet: sign language (USA)	ASL translator (USA)	Hand Talk Translator (Brazil)	Sign-Talk
Translate (user entered) text into sign language - avatar	✔	x	x	✔	x	✔	✔
Real life situation signs (leaner)	x	✔	x	x	x	x	✔
Sign language dictionary (learner)	✔	x	x	x	✔	x	✔
Sign language into text – avatar/ video (learner)	x	✔	x	✔	x	✔	✔
Accessibility options	x	x	✔	✔	✔	✔	✔
Find an online interpreter	x	x	✔	x	x	x	✔
Offline mode	✔	✔	x	✔	✔	x	✔
Translate the video transcript into sign-language	x	x	x	x	x	x	*
Translate the sign language into words real-time through camera	x	x	x	x	x	x	*
Alert feature (vibration) if someone calling their name or specific thing	x	x	x	x	x	x	*

Table 1 : Gap analysis

New features	*
Available	✔
Not available	x

Table 2 :   *Highlights*

3. Solution outline

This innovative solution is an app designed for the sign language community. It utilizes cutting-edge technology to translate sign language gestures into spoken language through an interactive avatar character. Protecting its intellectual property through patented avatar designs, proprietary gesture recognition, and the innovative integration of sign language translation algorithms, ensuring a secure and pioneering communication platform for the differently abled.

This solution for sign language users focuses on providing an inclusive platform by incorporating essential features found in existing apps while innovating additional functionalities to further enhance user experience. Users can effortlessly translate entered text into sign language using customizable avatars, enabling seamless communication. Real-life situation signs are introduced to aid learners in practical scenarios, enhancing their comprehension and adaptability. A comprehensive sign language dictionary facilitates learning and quick reference.

a. Translate the video transcript into sign-language (Third party apps like YouTube, Netflix In-built video player etc.)
b. Translate the sign language into words real-time through camera.
c. Alert feature (vibration) if someone is calling their name or specific thing.

The forefront of this innovative sign language application is user-centricity, primarily focusing on accessibility and empowerment. Through an intuitively designed interface, its core mission revolves around the dismantling of communication barriers. Users seamlessly translate sign language gestures into spoken English in real-time, whether engaging in interpersonal communication or viewing multimedia content on platforms such as YouTube. The application champions inclusivity, facilitating seamless interaction between users of spoken language and those utilizing sign language. Noteworthy for its emphasis on real-time translation and advanced alert functionalities, this technology sets a pioneering standard within the realm of assistive tools. Ultimately, it acts as a bridge between these distinct linguistic modalities, significantly enhancing the quality of life for the sign language community.

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4. Key benefits

4.1. Stakeholder benefits

a. Interpreters and support services - Increased knowledge and demand for sign language interpretation services can lead to more career possibilities and assistance for interpreters and related service providers, improving their job prospects.

b. Improved communication skills - Staff communication skills and overall service delivery could be improved by training and using better communication methods.

c. Economic benefits - By expanding the consumer base and providing jobs associated with accessibility efforts, ensuring accessibility can help economic growth.

d. Positive reputation - Service providers who stress accessibility and excellent communication build a positive reputation in the community, attracting more kinds of customers.

e. Support education and awareness - For hearing individuals that don't have first-hand experience with a friend or family member with a hearing impairment, there can sometimes be a certain discomfort with the unknown. But with an interpreter available, many hearing people can realize that individuals with hearing impairments aren't really that "different" at all – they simply need some small accommodations at times.

Figure SEQ Figure *
ARABIC 1 :
Stakeholders

4.2. Society benefits

a. Economic growth - Making public services more accessible and inclusive helps to drive economic growth by widening the consumer base and opening up new market opportunities.

b. Improved access for all - Many of the accessibility measures put in place to help people with special needs, such as ramps and clear advertising, benefit a wide range of people. Improved accessibility can also benefit the elderly, parents with strollers, and those with temporary injuries.

c. Reduced isolation - Special needs individuals may experience less social isolation if communication barriers are broken down and better access to essential services is provided. This can also lead to better mental and emotional health.

d. Educational opportunities - As society becomes more aware of the difficulties that people with special needs face, there is an opportunity for educational outreach. Society can learn about sign language, communication methods, and these people's needs, promoting understanding and empathy.

Figure SEQ Figure * ARABIC 2 :Sign-language

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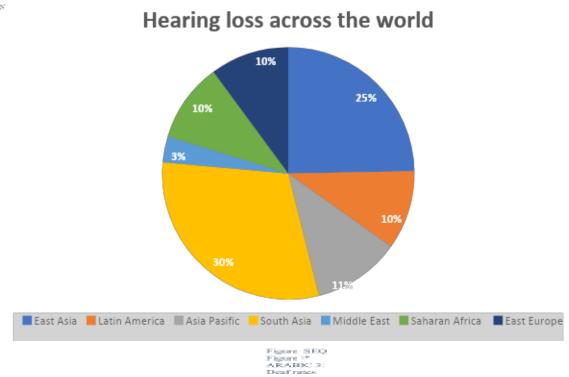
6. Appendices

6.1. Workload Matrix

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Researching topics distributed and the corporations given accordingly.						
Abstract				✔		
Introduction				✔		
Actual situation	✔					
Ideal situation	✔					
Gap					✔	
Root courses			✔			
Stakeholders		✔				
Gap analysis	✔					
Solution outline					✔	

Key benefits		✔️	✔️			
Report designing and editing	✔️					

6.2. Supplementary file

Hearing loss across the world

Figure SEQ Figure * ARABIC 3: Deafness

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