ASL Tutorial (American Sign Language) Mobile Application

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ABSTRACT

ASL Tutorial (American Sign Language) Mobile Application is an Online Mobile Application that was created for those who wants to learn American Sign Language to easily communicate to the deaf/mute person. This application inspired for the relatives of the deaf people, for them to easily communicate for each other. The application provides common greetings, words, numbers and alphabets. This application is a practice tool designed to help improve ability to read fingerspelling or actions. In converting text to sign language, a simple video will appear on the screen demonstrating the sign language. In other option, the user can record a voice message to convert into sign language. Simple video illustrations show how to sign common letters, greetings and a few common words in American Sign Language. This application is open for the person who wants to learn a sign language. The application was designed to run on an Android platform since 70% of the mobile users use Android Phone.

Keywords: *American Sign Language, Mobile Application, Tutorial*

1.0 Introduction

American Sign Language (ASL) could be a complex dialect that makes signs made by moving hands combined with facial expressions and stances of the body. It is one of the essential dialects of numerous North Americans who are hard of hearing and is one of a few communication options used by individuals who are hard of hearing or hard-of-hearing. ASL could be a dialect totally isolated and from English. ASL has its claim handle for word arrange, language structure,

and elocution. Sign dialect can be a assets fabric for dialect culture devotees, ASL understudies, and learners, instructors, translators, homeschoolers, and guardians for hone or self-study. This application was made for those who needed to memorize and get it the diverse sorts of words, commonly utilized welcome, letter sets, and numbers[1].

The researchers designed the application for everyone who want to know the sign language of a hearing-impaired person and are meant to teach conversation ASL (American Sign Language). Using video, it's packed with features to make learning ASL fun and easy. The application is especially providing the user with the opportunity to directly teach a hearing-impaired person without spending much on equipment.

The mobile application was designed to teach conversational ASL (American Sign Language). That allows the user to communicate effectively with a hearing-impaired person. The Application can support Android up to 4.4 KitKat version Android versions. The researchers have created an Android application that can help the users study American Sign Language by making a brief explanation of it stimulating the used animation and showing its simulation.

The mobile application cannot be used in iOS devices. The words included in the tutorial is limited to at least 300 words, commons greetings, alphabets and numbers. The application will not work if there's no internet connection and the researchers designed the application for those who wants to learn the sign language. The words that included on the database will appear on the textbox.

1.1 Objectives of the Study

This study entitled "ASL Tutorial" aim to attain the following objectives:

1. To develop an application that will provide users a visual and descriptive instruction of correct sign language to communicate effectively.

2. To provide the user an application that will convert the text and voice into sign language.

3. To use Android studio, Cordova, and Java in creating the mobile application.

2.0 Literature Review

American Sign Language

Deaf people as a minority have different experience in life, and these manifests itself in Deaf culture. This includes history, values, norms, beliefs, attitudes, literary traditions, and art shared by Deaf people[2].

Deaf people is at the heart of different communities in the world. Each of the community is a cultural group which shares a common heritage and sign language. Therefore, many of the deaf people around the world identify themselves as members of a linguistic and cultural group. Identification as a part of deaf community is a personal choice. Each individual; is independent to choose not to be automatically composed in a certain deaf community[3].

According to a hearing interpreter in sign-language, the instructors are all culturally deaf and all language classes are taught in sign language but with the help of an application, students will learn ASL through their full involvement [4]. The study

is related to other studies involving communication but unlike any other study, the researchers' application will vastly improve the communication between the hearing-impaired person to their relatives.

Through applications alike, learning American sign language are going to be lots easier and convenient for the deaf students and of course can facilitate them gain acquaintances with the identical things, they're going to be able to act with them through this. Plus, learning new and trendy signs are going to be this simple and accessible to everybody United Nations agency can transfer this application we've. it's conjointly designed for families or peers with the identical perplexity United Nations agency are in several states or countries; this application will cater their long-distance communication and bridge their conversations additional simply. As just like the alternative applications, activities here will facilitate the students' learning in American sign language progress by up their ability, perceive and comprehend their American sign language skills[5]. Similar to the researchers' project an application that is user-friendly. Today, learning ASL will just be a click away.

According to ProDeaf Mobile is Brazilian Sign Language translator application for Portuguese. With the help of this tool, you can automatically translate short sentences of written text or voice into Brazilian Sign Language to help you learn of this important language. This application is no required internet. This innovative Brazilian Sign Language - Portuguese translator is completely free[6]. Similar to the researchers this project can translate word written text or voice into American Sign Language to help the relatives of this important language. This innovative American Sign Language Translator is completely free.

Studies on Sign Language Interpreter for Deaf research conducted on deaf people is very limited especially for mobile application evaluations. Most of the studies focused on sign language interpreter using external hand gloves which is regarded as an expensive and non-usable by many deaf people. Besides that, studies are also focused on e-learning for deaf people, which are too general in terms of application development as well as in evaluation being conducted. Sign language interpreter are also known as speech to text converter or vice versa. The interpreter helps deaf people to communicate with others in ease without the need of third party help of interpretation. This interpreter technology enables translation of spoken words into text or video sign language and vice versa. According to Brooks, some important things need to be noted in sign language interpreter requirements such as clearly readable and as accurate as possible; display of large text and simple to be understood; display of accurate sign language appropriately; less delay in translation process and portable and not too large or too small of text or video display. Hearing-impaired people mostly depend on their interpreter for translating using sign language so they could communicate with normal people[7]. Similar to the researchers' project, this application also focused on learning the American Sign Language by the relatives of deaf people. Also, this application helps the relatives of the deaf people to communicate without the help of the interpreter.

According to the iCommunicator, an application designed to communicate and help deaf people or hard of hearing. It combines both the software and hardware that can interface with a user's hearing aids, cochlear implant speech processor or FM

listening system. The app uses real-time conversations by involving technologies that translate or convert spoken words into sign language, voice into text and text into speech. The iCommunicator includes different types of translation: speech to text, speech or text to video sign language, speech or text to automatic generated voice [8]. Similar to the researchers', this application is made for the people who wants to learn ASL, it helps the hearing world to communicate with the deaf people. The spoken words can translate into sign language using video or text to video sign language.

According to Uni, a tablet device produced by Motion Savvy that uses consistent two-way communication between the deaf and the hearing with distinct technology. First, the tablet reads sign language using the software integrated camera and special recognition software, then translates signs into voice generated words. Then, a hearing person speaks, the device converts that speech to text then displays it on the screen for the deaf person to read. It is a unique device that has potential to vastly improve the lives of deaf people. [9]. This application is similar to the researchers' application, when the hearing person speaks that spoken word is translated into sign language video for the deaf person read it.

Deaf people around the world have different sign languages that they currently use, and translating using sign language, or from a spoken language to sign, is still difficult. To create the application, the developers used machine learning, which is limited to a narrow use case: being able to make a schedule for an appointment in a clinic. The app is limited in how many phrases it can translate. [10]. The application is similar to the researchers' application, the researchers' application is also limited to 200 words to be translated, and the proponents are hoping to add more words to help the hearing person to learn more ASL.

According to the research SignAll is the best translation system available worldwide. They develop translating solution to enable further communication with the deaf people[11]. This application is used to translate to an ASL vocabulary similar to the researchers' application.

Interpreter

This application is designed for users of sign-language who are not able to use a phone. Similar to the NGTS, ASL users can use a phone with a qualified ASL interpreter and communicate effectively[12].

Android

Android's computer program was based mostly on completely different manipulation, that primarily use different gestures that corresponds to real- world actions, like swiping, sound and pinching to govern on-screen objects along with a virtual keyboard for text input. In addition to touchscreen devices, Google had any developed robot TV for televisions, robot automobile for cars and Android Wear for wrist joint watches, every with a specialized computer program. Variants of Android were conjointly used on notebooks, game consoles, digital cameras and different electronics [13].

Mobile Application

A mobile application, most typically brought up as an app, was a sort of application package designed to run on a mobile device. Mobile applications oft served to produce users with similar services to those accessed on PCs. Apps were typically

little, individual package units with restricted perform. consistent with the invention disclosed herein relates to the sector of engineering science and telecommunications. it's special technology, satellite communications, and digital cellular communications and is directly associated with local/wide space networks and net protocol (IP) technology communications[14].

According to the report "Literature Review in Mobile Technologies and Learning" written by Bacsich, P, Ash, C, Boniwell, K and Kaplan, L (1999), Colley, J and Stead, G (2003), Corlett, D, Sharples, M, Chan, T and Bull, S (2004), mobile technologies have become additional popular increased capabilities for various interactions, context perception and property. Aforementioned technologies will have totally different impact on learning. It may be an excellent facilitate to the those that desires to find out [15]. Similar to the researchers this project wants to help the relatives of the hearing-impaired person. The researchers want to help the people who want to learn ASL to communicate to the hearing-impaired person.

According to webopedia.com, the mobile applications mentioned will support the user by linking them to an online service that are employed in the pc and laptops. Mobile applications are web applications designed to run and treat good phones these days [16]. This study is related to other studies involving communication, but the researchers created a Mobile Application for hearing impaired-person to easily communicate.

Java

A relatively new and powerful programing language that has several helpful options to software package developers. It hereditary its strengths from C++ whereas eliminating most of the issues of C++. The syntax and programming logic of Java is incredibly almost like that of C++. Java is easy, object-oriented, portable, robust, and multithreaded. Java is that the foundation for humanoid development, thus if you wish a mobile application specifically for humanoid, then Java are going to be your language of selection. [17].

3.0 Methods

3.1 Research Phase

The researchers choose to use the Mobile Application Development Life Cycle because in this method ensures that the user will don't waste valuable resources and time during the mobile application development phase. The chosen method has five phases Idea phase, design phase, development phase, testing phase and maintenance phase that help the proponents to develop the application.

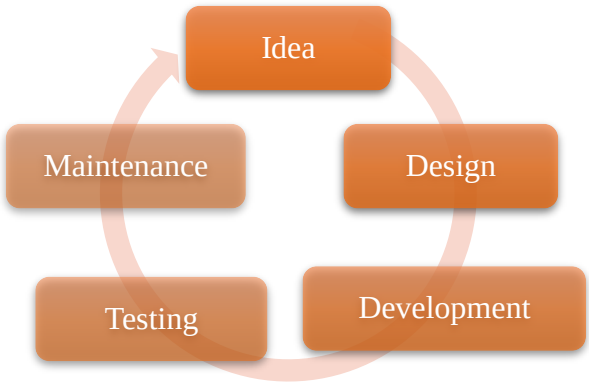

Figure 1: Mobile Application Development Life Cycle Method

3.2 Idea

In this phase, the researchers 'dedicated enough time to this phase, collecting data and interview some relatives of the hearing-impaired persons. The

researcher focus on how we teach the relatives and how it helps to them but the application is open for who wants to learn the sign language.

3.3 Design

At this phase, the researchers focused on making a design that would help the application looked good or an application that is user-friendly. This phase is where the actual development of the application.

The requirement for creating the application are as following:

Software: Adobe Photoshop, Android Studio, Cordova, and Java

Hardware: PC/Laptops, Android Smartphone (Kitkat Version 4.4 and up)

3.4 Development

At this phase, the researchers must keep in mind the different outcomes for the development of the application, for instances, it might be unstable to run on such devices so we installed the app on compatible android devices and previewed it several times.

3.5 Testing

In this phase the researchers tested the application and concluded an outcome that the application is properly working as tested on compatible android device or KitKat 4.4 and up.

3.6 Maintenance

In this phase the Mobile Application maintenance includes providing software updates by adding words/common greetings and enhancing the user-interface of the application on compatible android devices.

4.0 Discussions

Flowchart

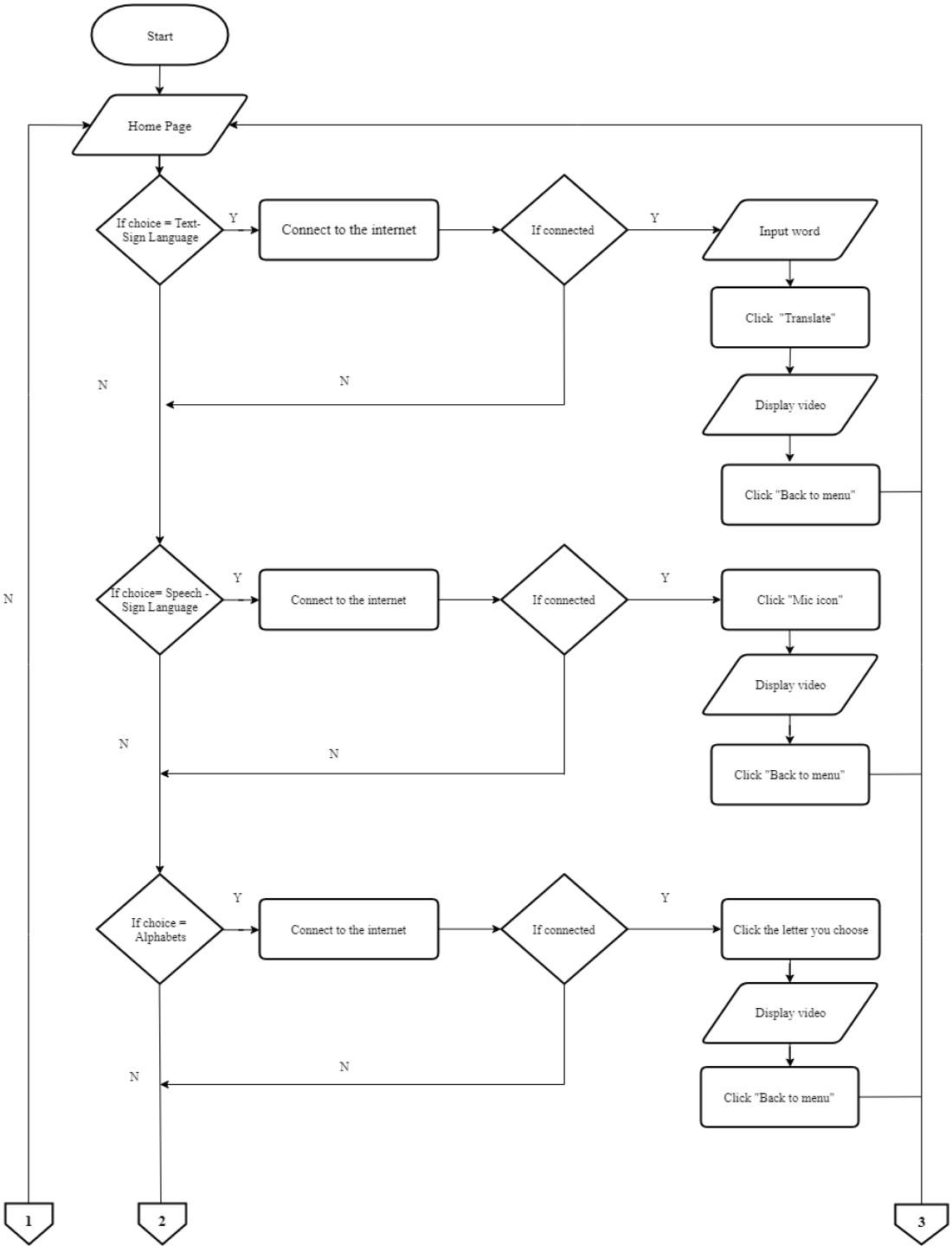

Figure 2: Application

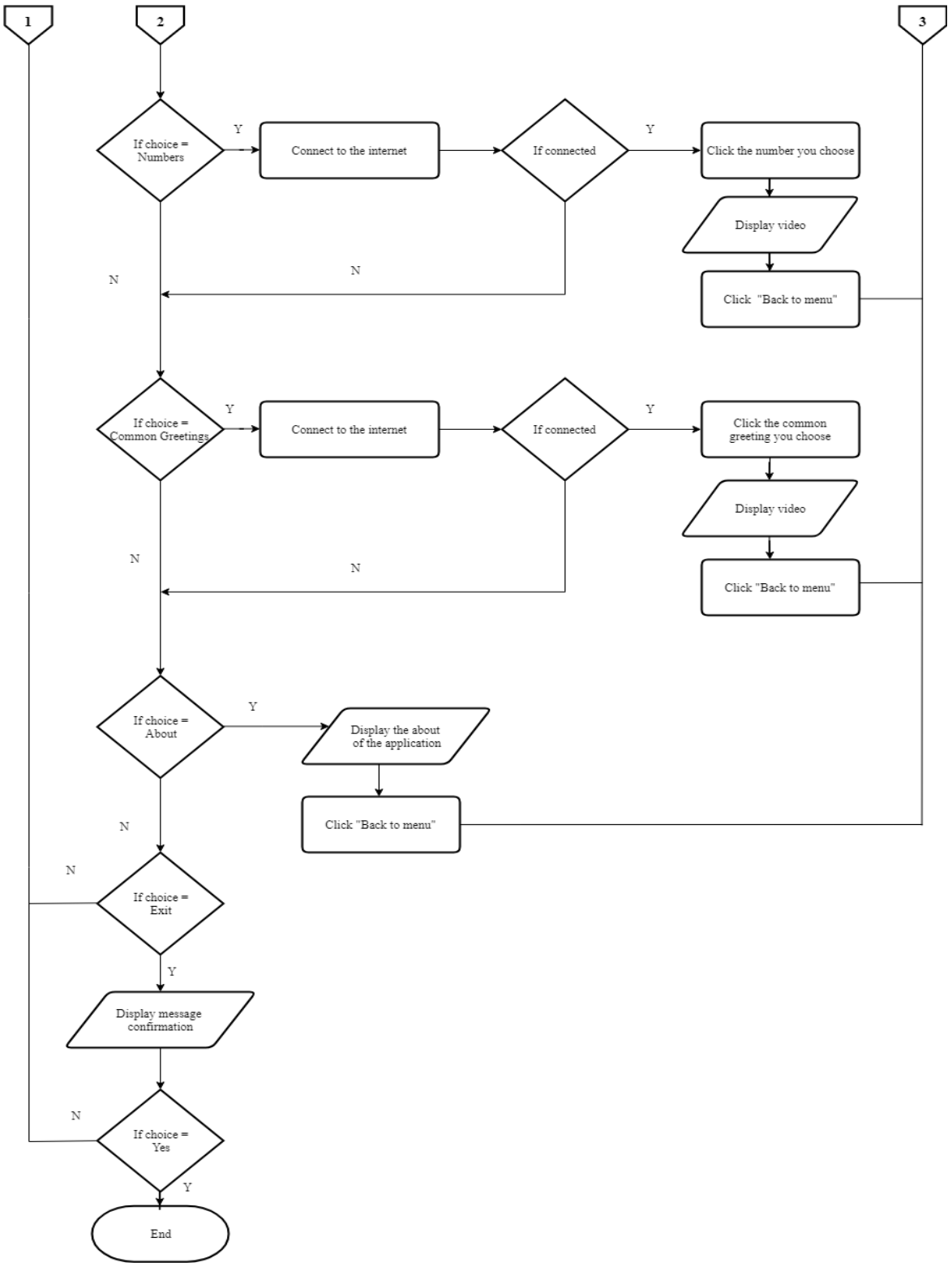

Figure 3: Application continued

Screen Layout

Figure 4. Homescreen/Mainscreen
This figure shows the home screen that will display the menu for converting the words or voice into sign language.

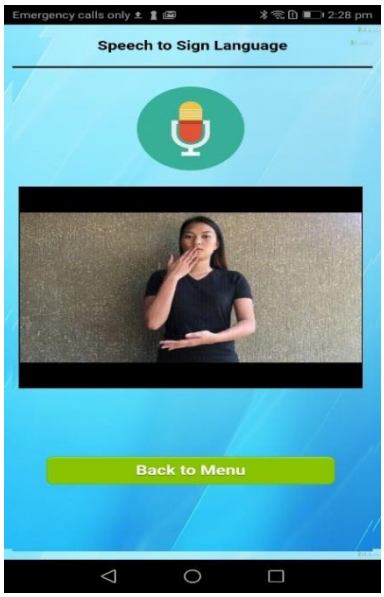

Figure 6. Speak – Sign Langugae
This figure shows how the user needs to speak the word they want to translate and the video will appear.

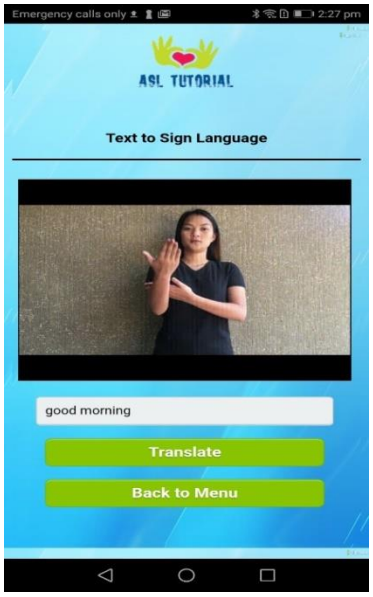

Figure 5. Text – Sign Language
This figure shows how the user will type the word to be translated then a video appear.

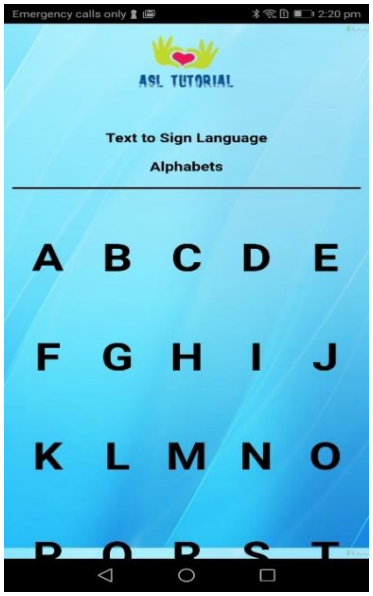

Figure 7. Alphabets
This figure shows the letters of the alphabet that the user wants to translate.

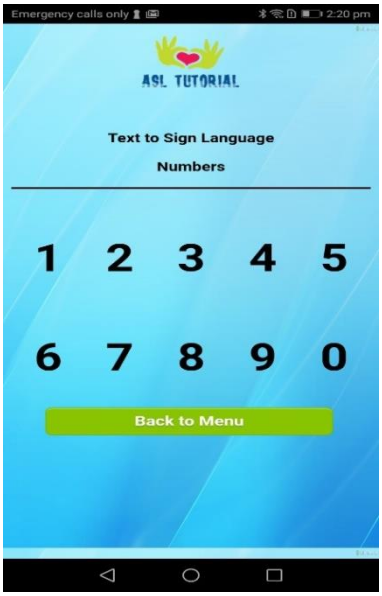

Figure 8. Numbers
This figure shows the number that the user wants to translate.

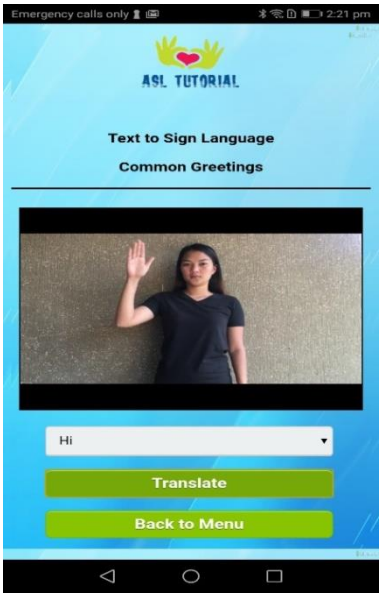

Figure 9: Common Greetings
This figure shows how the user will select the common greetings they want to translate.

Figure 10: About the Application
This figure shows the short introduction about the application.

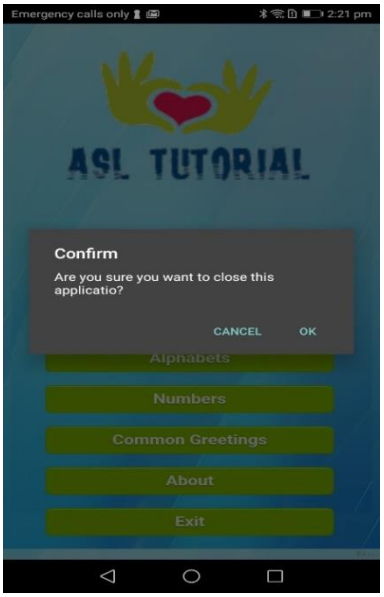

Figure 11: Exit
This figure shows how the confirmation will appear when you exit the application.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

American Sign Language (ASL) is a simple way to easily communicate with deaf people. It is an easy way to make conversation with them.

The researcher focuses on how to easily communicate to the deaf and/or mute. This application be beneficial to people who want to learn different sign language.

The ASL Tutorial (American Sign Language) is all about teaching you conversational ASL. Packed with 300+ signs and phrases, easy navigation and features, with different signers.

CONCLUSIONS

1. The mobile application is created to provide the users an easy way to better communicate and understand people who are deaf and/or mute. The application is designed for those who want to learn a sign language.
2. For converting, the application offers to either converts text to sign language and speak to sign language for them to easily communicate for each other. The words that are included in the database is limited at least 300 words, common greetings, numbers and alphabets.
3. ASL Tutorial (American Sign Language) Mobile Application is an application for those who want to learn different sign language.

RECOMMENDATIONS

This study can be a source of knowledge for other researchers who are creating a related kind of mobile application. The developers recommend that other words/commonly used in greetings be added to improve usability and context of the application. It is also recommended to improve the reliability and accuracy of the voice to video and text to video. The user interface can be improved by replacing some elements in the application. This study can be a reference to researchers who are into developing a mobile application regarding sign language translation.

References:

[1] National Institute on Deafness and other Communication Disorders (2015). Retrieved from: <https://www.nidcd.nih.gov/health/american-sign-language>

[2] FAQ on Deaf Culture (2015) Retrieved from:<http://theaslapp.com/faq/>

[3] Malzkhun, Kettering (2017). Deaf Culture. Retrieved from: <http://theaslapp.com/faq/>

[4] Katherine Timpf (2017). Op Ed: Hearing Instructors in Sign-Language Classes Is 'Cultural Appropriation' Retrieved from: <https://www.nationalreview.com/2017/04/sign-language-instructors-cultural-appropriation-instructors-hear>

[5] L. Naismith (2004). Literature Review in Mobile Technologies and Learning. Retrieved from: <https://lra.le.ac.uk/bitstream/2381/8132/4/%5B08%5DMobile_Review%5B1%5D.pdf>

[6] QuemSomos (2010). ProDeaf Mobile App. Retrieved from: <http://www.prodeaf.net/en-us/Solucoes>

[7] Indian Sign language (2010). Citations. Retrieved from: <https://www.researchgate.net/publication/224179662_Indian_sign_language_recognition_system_to_aid_deaf-dumb_people>

[8] Andrew Leibs(2018) . Citations Retrieved from: https://www.lifewire.com/icommunicator-translates-speech-text-sign-language-198916

[9] Zach Epstein (2015) Citations: Retrieved from: http://bgr.com/2015/12/04/sign-language-translator-uni-deaf/

[10] Julianna Baggott (2018) Citations Retrieved from: https://motherboard.vice.com/en_us/article/zmgnd9/app-to-translate-sign-language

[11] ZsoltRobotka, Janos Rovnyai, Nora Szeles, David Retek, MartonKajtar, Sean Gerlis, Tina Leonard, Milad Vafaeifard, Dawn Croasmun, David Palhazi, Helga Maria Szabo Citations Retrieved from: http://www.signall.us

[12] Victoria Court, Quarry Lane Branton Citations Retrieved from: http://interpreternow.co.uk/

[13] Utest (2017). Software Testing Article. Retrieved from: <https://www.utest.com/articles/android-edit-status>

[14] D. Jannsen (2016). Mobile Application. Retrieved from: <https://www.techopedia.com/definit

ion/2953/mobile-application-mobile-app>

[15] "Literature Review in Mobile Technologies and Learning" written by Bacsich, P, Ash, C, Boniwell, K and Kaplan, L (1999), Colley, J and Stead, G (2003), Corlett, D, Sharples, M, Chan, T and Bull, S (2004)

[16] Quin Street Inc (2015). Deaf Mobile Application. Retrieved from: https://www.webopedia.com/

[17] Upwork Global Inc (2015). The Basics Java. Retrieved from: https://www.upwork.com/hiring/development/java-vs-c-which-language-is-right-for-your-software-project/