Eph - International Journal Of Science And Engineering
ISSN (Online): 2454 2016
Volume 03 Issue 03 September 2017

DOI:https://doi.org/10.53555/eijse.v3i3.93

A COMMUNICATION TOOL, MOBILE APPLICATION ARABIC & AMERICAN SIGN LANGUAGES (ARSL) SIGN LANGUAGE (ASL) AS PART OF TEACHING AND LEARNING

Fatima Al Dhaen[1*]
[*1]*Ahlia University Information Technology Dep. P.O. Box 10878, 1st Floor, Gosi Complex, Exhibitions Road, Manama Kingdom of Bahrain*

Corresponding author:
Email: faldhaen@ahlia.edu.bh, fatima998877@yahoo.com

Abstract:-
The aim of this application is to support deaf and dumb students, parents and lecturers to learn a powerful mechanism to assists special needs in their daily life routine and to integrate applications as a tool in communicating with them. The application demonstrates various ways of communication oral, symbolic and written which provides an oversight on ways.

1- INTRODUCTION

A **sign language** is a language which uses manual communication and body language to convey meaning, as opposed to acoustically conveyed sound patterns therefore communities of deaf people exist, sign languages have been developed. Signing is not only used by the deaf, it is also used by people who can hear, but cannot physically speak.

The aspiration of students to learn sign language escalates every day. National TV channels and visual media outlets in the Middle East are displaying and showcasing ASl translation in all their TV programs to be able to interact with those special needs who would like to understand what is happening in the real world. In Higher education instructions, ordinary students are articulating and expressing their interest to be connected with others who are special needs.
Everyone deserves to express his/her feelings no matter the conditions or situations are. Sign language is a two-way communications between a special needs or ordinary people; it could be in schools, universities or any career. Deaf individuals should be always integrated in kind of activities to be able to express their feelings.
Nowadays technology becomes something indispensable in our life such as smartphone, PDA and tablets devices make sign language interpretation more attractive, accessible and valuable.

Using Smartphone devices instead of personal computer base in sign languages gives several advantages. Smartphones applications are now available with almost free or with minimal fee in play stores or apple stores, user can download those applications freely with no single hassle or obstacle.

Voice transmission and data transmission between mobile units or unit server are available, since the internet is accessible couple of years ago when the WAP was a global specification that empowers mobile users with wireless devices to simply access and cooperate with information and services directly. The WAP is a global specification that empowers mobile users with wireless devices to easily access and interact with information and services instantly. WAP makes it possibly to communicate with the mobile user and to send and receive information [1]

When talking about the advantages of mobile applications compared to desktop applications in users' point of view, it is noticeable that the mobile applications are better since the users doesn't have to reinstall the newer version of the application and lose all their data. Also the mobility of the applications makes it easier to the user to use anywhere, as well as the user's computer will be more protected from the viruses since there is nothing downloaded from the internet and also the app market checks it before it is published. Regarding the developers, it's easier to update and modify the mobile application with the new compilers.

2- Problem Statement:

Mobile services and internet connections have been increasing promptly and rapidly in the entire world; however it has been notices that most of the educational mobile applications are only displaying signs images by entering a letter, word or statement particularly in Arabic sign language

The current research showed that only one-way systems are available in both languages which give the user the option of convert signs language to words or numbers.
The hearing impaired individuals been left behind since those people can slightly hear or listen, application should provide voice speakers to be able to hear the world probably with flexibility to raise or lower the volume of the sound besides sign language platform.

3- Related work Sign Language Translation Systems

Many translation tools been invented and discussed to interpret sign language to different formats using avatar and many other tools.

First related system was done in British post office to translate English speech to British sign language. This system was developed for use in the post office. Its functionalities and vocabulary were limited to the post office use. [2] The system uses an avatar for displaying the sign language words. The system has accomplished a splendid rate of accuracy in expressions, phrases and displaying single words.

The second system [3] was implemented by using avatar and describing the architecture of an English text to sign language.
The second related system was implemented as Language translation system which basically translates the English text to other sign languages such as German and Dutch. The translation process was divided into two parts. The first segment was to convert the English text to a semantic-based form. And the second segment was to translate the semantic-based form into to a graphic representation.

The third system [4] was done to translate from American English speech to American Sign Language. It contained The ASL words were done in video format and stored in the database. The speech recognition was done using a MAC OS speech recognition engine. The main issue with this system is that it only identifies pre- defined words.
ASL was tested and evaluated to assure that the entire requirement been met and fulfilled. ASL is a user friendly application which has a very clear buttons, icons and titles that indicate the feature of the application besides it works

efficiently and smoothly during numerous testing of its features. Moreover ASl won't affect other applications at all, it runs normally
without any obstacles or hindrances

4- Model used

An iterative waterfall model was selected to implement this application. The iterative waterfall model life cycle model doesn't have to start with a full requirement. Instead, development begins by specifying and implementing just part of the software, which can then be reviewed in order to identify further requirements. This process is then repeated, producing a new version of the software for each cycle of the model.

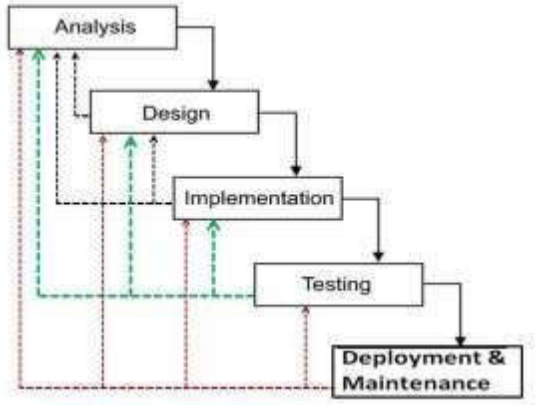

Figure 11: Waterfall Model or Life Cycle Model

(Pradip Peter Dey et al)

4.1 Advantages of waterfall model:

- Simple and easy to understand and use.
- In this model phases are processed and completed one at a time. Phases do not overlap.
- Waterfall model works well for smaller projects where requirements are very well understood.

4.2 The phases of Waterfall model:

4.2.1. Requirements:

Define a complete description about the main idea and goals of the project, as well as the other details and contents to determine its demands and prepare them.

- Who is going to use the application?
- What is the important information and services should be for the application?
- What is the important data should be in the application?

These are general questions that get answered during a requirements gathering phase

4.2.2. Design: It's similar to find a solution for the problem. Designing the project is a step towards solving your problem by designing a plan for a solution.

4.2.3. Implementation:

The actual work and building of the application. In other words, it's the realization of the application by executing the idea, plan, model and design.

4.2.4. Verification:

Test the application to verify it performance and find out any deficient or errors.

4.2.5. Maintenance:

Modify the application and correct any fault to improve the performance and provide high level of utilization.

5- System Design

Main menu the application's main menu was tested and evaluated to make sure that it works correctly. The testing was done through a survey given to many special needs students.
Main menu has 4 buttons [About, ASL American, ARSL Arabic, Thanks to] Figure 1
and Figure 2

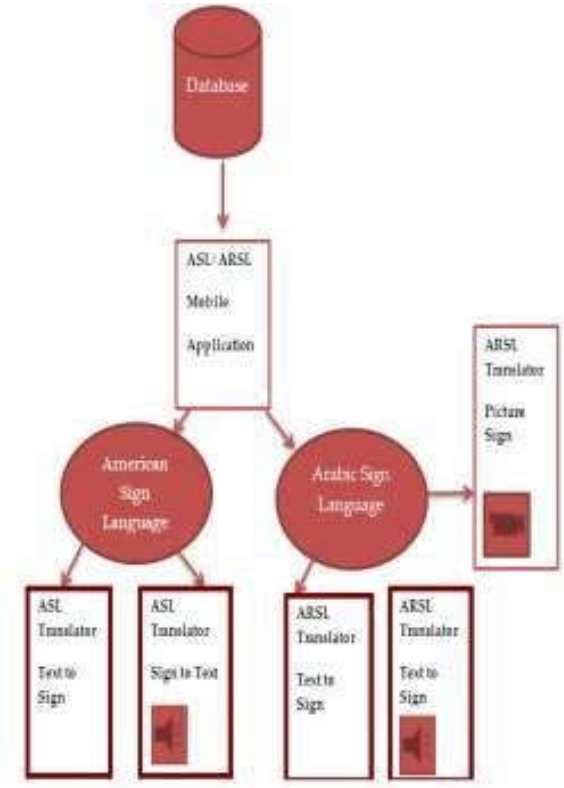

Figure 1

About Button: To give the user all the information he/she needs to interact with the application

Figure 2.

ASL American Button: once the user clicks on it 4 other buttons will be displayed [Number sign, Number, Alphabet sign and alphabet] as it shown below Figure 3

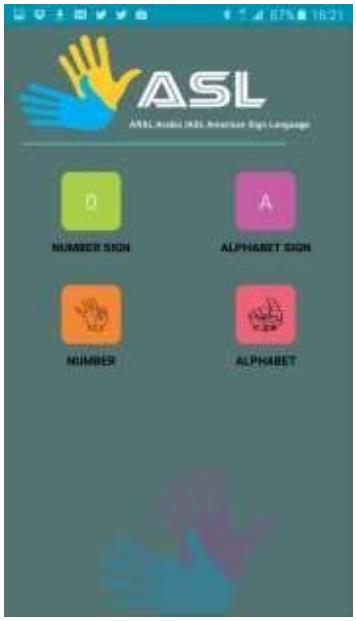

Figure 3

Number's button

[Translate American numbers to American sign numbers] If the user clicks on numbers, a window shows ordinal numbers from 0 to 9 through an application keyboard, once the user presses on any of those keys, the American sign numbers will be converted and shown above with voice speaker for those who have hearing impairment. As shown below figure 4

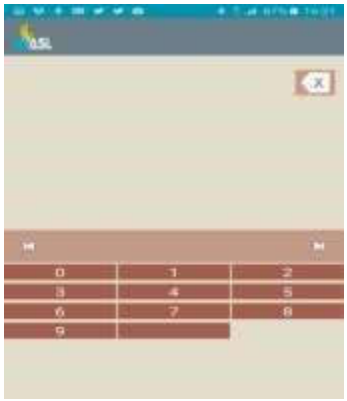

Figure 4

Sign Number's button

[Translate American sign numbers to American Numbers] If the user clicks on numbers , a window shows numbers from 0 to 9 but as signs through an application keyboard ,once the user presses on any of those keys , the American numbers will be converted and shown above with voice speaker for those who have hearing impairment. As shown below in figure 5

Figure 5

Alphabet's button
[Translate American letters to American signs letters] If the user clicks on letters , a window shows letters from A to Z through an application keyboard ,once the user presses on any of those keys , the American letters will be translated to sign language words and shown above with voice speaker for those who have hearing impairment. As shown below in figure 6

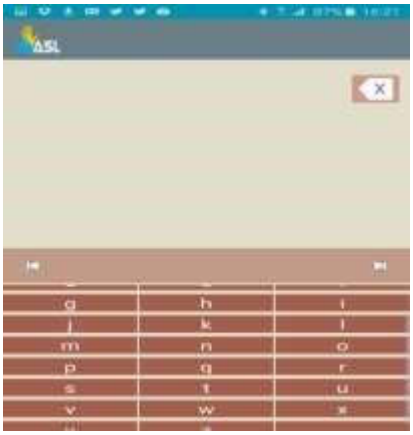

Figure 6

Sign Alphabet letter's button [Translate American sign letters to American words] American Signs will be converted to letters with Voice over for those who have hearing impairment beside it can be deleted easily through the arrows and can be easily shifted to numbers as well , as shown below in figure 7.

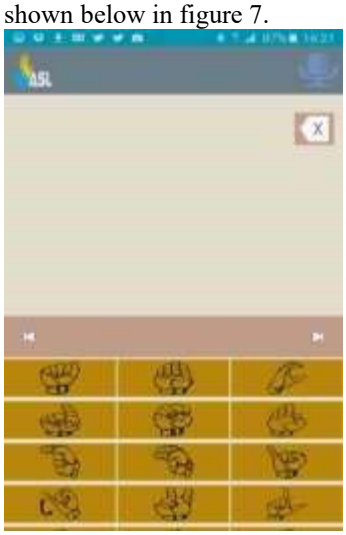

Figure 7

*User has the flexibility to delete or reset that window.
* The same functions are applied for Arabic sign language **as** it shown in figure 8.

Figure 8

Therefore video clips are available are also available through pictures categorized as transportation, family, food and many the
categories as it shown below in figure 9

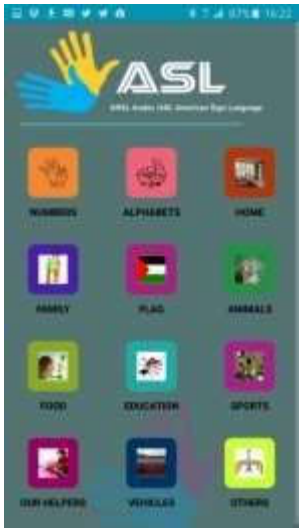

Figure 9

Each category has its own clickable pictures so once the user click on any desired picture, a video will be played instantly as it shown below in **figure 10**

Figure 10

Video always helps to comprehend rapidly and more flexible way, user can play several times and can imitate the gestures.

6- Conclusions and future plans

Application development has no particular end; there are no limits for development. And there are a lot of things that will be developed in the application .To make this application better and better, I must not stop at this point and try to continue evolving and adding new features to the application. Some of the plans are to categorize the application more; It should be noted that there is a lot of rooms for further performance Improvement considering different methods and approaches to add different languages so in the first coming updates for the language it is going to be developing application for other language such as French or Italian and so on till covering some of the languages around the world. As you observed that the application is limited to those who have Android devices, it will be in future plan available Apple devices. Then and most of all is improving the UI to make it user friendly and more attractive by using Image processing and camera reader techniques to recognize visual sign language and translate them into any text in any language .

References

[1].H. Sagawa and M. Takeuchi, 2002, *A Teaching System of Japanese Sign Language Using Sign Language Recognition and Generation. In MULTIMEDIA* '02: Proceedings of the 10th ACM international conference on Multimedia, P 137–145. ACM Press, New York, NY, USA,

[2].Alison Wary, Stephen Cox, 2004. Mike Lincoln and Judy Tryggvason, "*A formulaic Approach to Translation at the Post Office: Reading the Signs", The Journal of Language & Communication*, No. 24, p. 59-75,

[3].Eva Safar and Ian Marshal, 2001. "*TheArchitecture of an English-Text-to-Sign-Language Translation System",* Recent Advances in Natural Language Processing (RANLP) G. Angelova et al (ed), Tzigov Chark, pp. 223-228, Bulgaria

[4].T. Scarlatos, L. Scarlatos, F. Gallarotti, "iSIGN, 2003, *" Making The Benefits of Reading Aloud Accessible to Families with Deaf Children", The 6th IASTED International Conference on Computers, Graphics, and Imaging CGIM* 2003, Hawaii, USA 13- 15.