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Article

# Usability Evaluation Of The Mobile-Based Language Translation System

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***Abstract*—** This study was conducted to evaluate the usability of the developed mobile-based language translation system. Specifically, it aimed to design and develop an application that will translate Ibanag to Tagalog and English, a search facility and a database for list of Ibanag words; and to evaluate the application based on the four aspects of usability (e.g. usefulness, ease of use, ease of learning and satisfaction). The study made use of a descriptive method of research. Participants' evaluation toward the usability of the application were determined through a survey questionnaire. Weighted mean was used to analyze the data gathered from 400 respondents. Results showed that the mobile-based language translation system has met all the required functions and it is usable in terms of usefulness, ease of use, ease of learning and satisfaction.

*Keywords*— usability, evaluation, mobile-based, language, translation

## I. Introduction

The massive development of technology formed a vital effect on different organizations, offices as well as in the education arena. This has great influence on the schoolrooms and become an integral part of the teaching-learning interaction, through such approaches as using interactive devices or tools like digital whiteboards, using students' own smartphones, mobile and android devices or other devices for learning during class time. Nowadays, mobile devices play an increasing role in educational institutions and are considered as potentially valuable learning tools that led to innovative changes in the way teachers teach and learners learn. This has opened up new learning experiences with technology and commonly used devices among the portable technological tools for learning. Indeed, their portability and accessibility many scholars considered it in the educational settings for learning and teaching purposes [2]. Researches revealed that mobile phones can be used to leverage instruction, empower place-based learning and amplify teaching [8]. Likewise, it is an effective tool for language learning in general. [9] have a positive effect on the development of language skills, and heighten learners' language learning attitudes and motivation [3].

One of the applications that can be designed for mobile devices or phones is the development of mobile based language translation systems. Translation plays a vital role in globalization of cultures as this would help revive its indigenous cultures to ensure the preservation of the history, belief and practice and most especially the language. Thus, the researcher aimed to develop a mobile-based translation system and evaluate its usability. There is much research being conducted regarding the end-user's perspective on the usability of a developed system or application. Reference [4] stated that usability is one of the key parameters to make a mobile application used and loved by the users, and this also enables in achieving their specified goals. Also, efficiency, effectiveness and satisfaction are also key factors that determine user experience when they are engaging with an application. However, this research only focused on evaluating the usability of mobile-based applications that will translate Ibanag to Tagalog and English words with the related words or phrases and auditory modality to guide users on correct pronunciation of words. This application can serve as one of the tools or repositories for the preservation and survival of the Ibanag language in the Philippines [6]. Moreover, [6] stated that it is also another rich source of digital tools which can be used in the different sectors including schools, communities and government institutions.

## OBJECTIVES OF THE STUDY

The general objective of the study is to develop a mobile-based language translation that provides an interactive and easy to use system for the Ibanag Community.

Specifically, it aimed to:

1. Design and develop a multilingual mobile-based application that will translate Ibanag to Tagalog and English with search facility, auditory modality and list of words.
2. Evaluate the usability of the developed application based on the participant's perception.

## II. Literature Review

The advancement of today's technology has led to numerous developments in language translation systems. Despite

various translation methods, challenges and limitations still persist.
Reference [12] explored the role of translation in preserving endangered languages, emphasizing its significance in multiple domains such as science, technology, commerce, business, arts, and education. He stressed that translation serves as a bridge between languages and cultures, promoting cross-cultural communication. Additionally, the rise of translation as a distinct discipline has increased access to minor and native literatures.
According to a report, increasing the number of speakers of endangered languages is difficult, but recording, interpreting, and translating them is vital for cultural preservation. Likewise, the key benefits of translation software, including cost and time efficiency, consistency in terminology, and easy access to various formats without requiring software ownership [13].

*Mobile-Assisted Language Learning (MALL) and Pedagogical Applications*
Recent studies have highlighted the growing role of mobile and web-based translation tools in education. Researchers suggest that integrating translation tools into language learning programs can make them valuable pedagogical resources. Reference [14] noted that mobile applications have introduced new learning experiences, making them widely used portable tools. The accessibility and convenience of mobile apps have encouraged their adoption in educational settings. Research further indicates that mobile phones can support various instructional approaches, enabling place-based learning [15]. Reference [16] introduced the concept of Mobile-Assisted Language Learning (MALL), describing it as an approach that enhances language acquisition through mobile devices such as smartphones, MP3/MP4 players, and personal digital assistants. He outlined several pedagogical strategies for mobile-based language learning, including error detection, structured lesson content, voice recordings for pronunciation, interactive exercises, and multimodal learning applications.
*Moreover,* mobile apps offer a variety of resources that help learners manage their study time efficiently. Reference [17], discussed the advantages of mobile dictionaries, which provide extensive word searches, pronunciation aids, and multimedia elements to enhance comprehension.

## III. Materials and Methods

This study used the mixed method design involving two phases: the system designs and descriptive research. The first phase is the development of the application and the second phase is the participant's assessment with respect to the usability of the application. This study utilized a program design process taken from the study of [5] and was modified integrating the components of Knowledge Based System, Inference Engine and User Interface as shown in Figure 1**.**

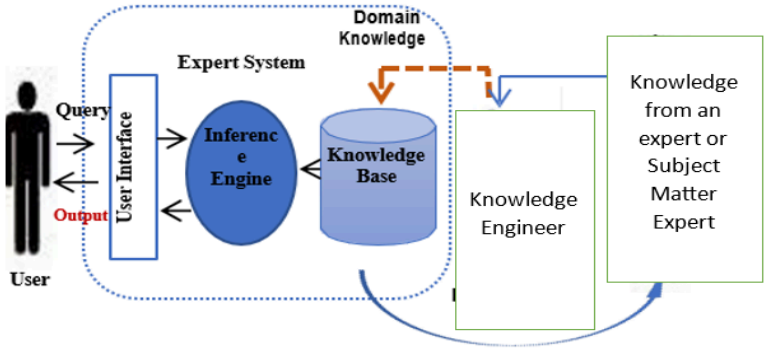


Figure 1. System Architecture

The development of the application is initiated through the identification of the **subject matter expert (Ibanag Language expert**s) where the Ibang words and its translation from Tagalog and English was derived. The translated words were also submitted to the language experts for validation and these are acquired knowledge decoded into computer usable language that is stored in knowledge based (served as knowledge repository) and designed an inference engine (through the IF-THEN rules) and reasoning structure that uses the knowledge appropriately. This study also utilizes domain knowledge to integrate the use of certain knowledge in the translation process. In this phase, if the user inputted words or simple phrases for translation is not found in the knowledge base, an error message is displayed otherwise the corresponding translated word will be processed and displayed. In the inference engine, the IF-THEN rules were used through the search method and translation process. The individual words are then mapped into the target language, present in the knowledge base where it consists of equivalent words in the source and target languages. Using the generated knowledge of Ibanag word/term from the knowledge base, a sorting algorithm is coded in the system and applied to generate a translation of Ibanag to Tagalog or English and a list of terms which was sorted in ascending order [5]. Likewise, the user interface enables the user to communicate with the KBS to make a query or view the translated words.
***System Evaluation.*** There were two groups of participants who evaluated the developed system. The first groups were the Ibanag speakers and tourist or non-Ibanag speakers who were purposely selected. The second was a group of three IT experts.
*Data Gathering Procedure.* A USE questionnaire was prepared in gathering the data on the usability of the

mobile-based language translation. The questionnaire uses 30 questions to evaluate the application which was adopted from Reference [4] et.al and [1] and later modified based on IT expert's suggestions. The questionnaire consists of four usability aspects: ease of use, satisfaction, usefulness and ease of learning. A pre-test was conducted among IT experts to ensure the reliability and validity of the items and to obtain other information on the usability criteria of a system. The developed application was uploaded and made available for users and experts to view, access and install to their android phones. An evaluation was conducted after the actual demonstration and use of the application. The researcher was then personally floated and collected the questionnaire to ensure a one hundred percent (100%) retrieval.

## IV. Result and Discussion

The figure below shows the interface of the developed mobile application The developed mode app has four sub menus 1) Home, 2) Word Lists, 3) Word Translator, and 4) Update Phrase.

Figure 2 shows the home page of the mobile app where it provides a search box and the menu like icon to view the sub-menus such as the Word List, Word Translator and Update phrase.

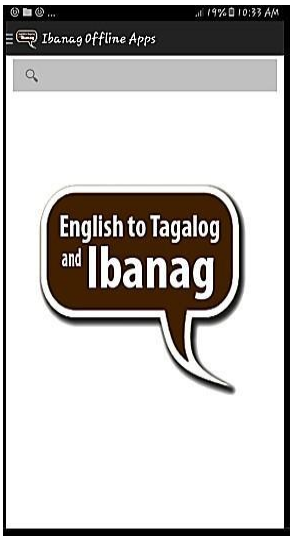


**Figure 2. The Mobile App Home Page The Search Facility**

Figure 3 shows the search box for the offline mobile interface where users can search a particular word and view the translated word/s or phrases in Ibanag to Tagalog and English or vice versa upon search key from android phone. The output of the searched word also provides a text link to view the equivalent word in Ibanag or English upon clicking the link of the word.


Figure 3. The Search Box

Figure 4 shows the menu-like icon which consists of sub-menus such as Home, List of words, Word Translation and Update Words. The users must swipe the menu like icon to view the different sub-menus.

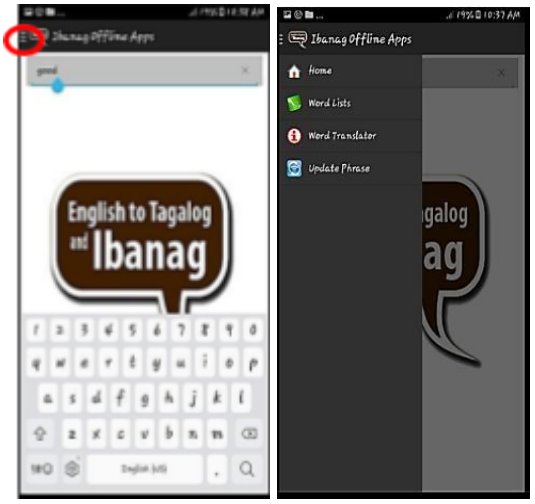


**Figure 4. The Mobile Interface Menu Swipe Mode**

Figure 5 shows the list of English words where users can also view the corresponding word in Tagalog and Ibanag upon clicking the text link provided for every word. Users must also swipe or scroll up to view the other list of words.


**Figure 5. List of Words**

Figure 6 shows the translation page in an offline mode which allows the user to choose the translation type and enter the word to be translated in the textbox provided. However, an error message will be displayed if the entered word cannot be found in the database.

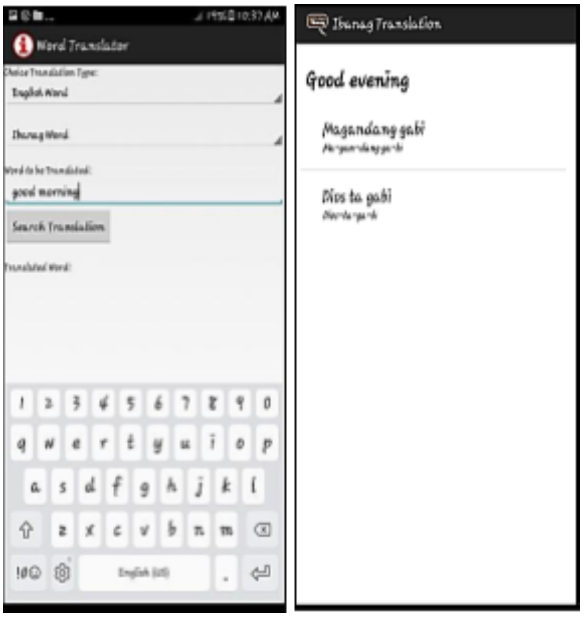


**Figure 6. The Translation Page**

Figure 7 shows the update page for the offline mobile app where users are allowed to update the files or data for

translation. However, updating of files or data can only be done if connected to the internet.


**Figure 7. Updating of Data**

*System Evaluation*

The Usability of the developed application as to Usefulness, Ease of use, Ease of Learning and Satisfaction.

Table 1. Usefulness Aspect

| Statement | Weighted Mean | Descriptive Equivalent |
|---|---|---|
| 1. The application is useful. | 4.96 | Strongly Agree |
| 2. The application is helpful to user or to the language learner | 4.97 | Strongly Agree |
| 3. The application does everything I would expect it to do. | 4.75 | Strongly Agree |
| 4. The application offers tools (resources, list of words, etc.) that support language learning. | 4.97 | Strongly Agree |
| 5. The Multilingual feature of the application support is very useful. | 4.94 | Strongly Agree |
| 6. The application has audio features that provide proper pronunciation of the Ibanag word. | 4.95 | Strongly Agree |
| 7. The application can use it anytime or anywhere when I need it. | 4.95 | Strongly Agree |
| 8. The application is convenient for language learners | 4.75 | Strongly Agree |
| **Overall Weighted Mean** | **4.91** | **Strongly Agree** |

Table 1 shows that the mean assessment of the participants on the Usefulness aspect of the application ranges from 4.75 to 4.97. The highest mean ratings were given on *"The application offers tools that support language learning"* and *"The application is helpful to user or to the language learner"* as can be seen in item number 2 and 4 with a weighted mean of 4.97 and 4.96 correspondingly. This result is supported by [10],[11] that it makes the learning process more productive and motivating for learners; and can enhance learners' second language acquisition. The mean assessment in all the items of usefulness aspect have qualitative ratings that are described as "Strongly agree" which implies that generally the usability of the application was useful to the participants.

**Table 2. Ease of Use Aspect**

| Statement | Weighted Mean | Descriptive Equivalent |
|---|---|---|
| 1. The application is easy to use. | 4.97 | Strongly Agree |
| 2. The application is simple to use. | 4.96 | Strongly Agree |
| 3. The application is user friendly. | 4.98 | Strongly Agree |
| 4. The application requires fewest steps possible to view the output | 4.95 | Strongly Agree |
| 5. Using the application is effortless | 4. 81 | Strongly Agree |
| 6. The application can be used without written instructions. | 4.96 | Strongly Agree |
| 7. The application is consistent with its output. | 4.95 | Strongly Agree |

| | | |
|---|---|---|
| 8. The application can recover from mistakes quickly and easily. | 4.95 | Strongly Agree |
| 9. The application search button gives a response immediately after the click is made. | 4.95 | Strongly Agree |
| 10. Users can navigate the application without difficulty. | 4.98 | Strongly Agree |
| **Overall Weighted Mean** | **4.95** | **Strongly Agree** |

Table 2 shows that the mean assessment of the participants on the ease of use of the application ranges from 4.81 to 4.97. The participants strongly agree that *"The application is user friendly", "The application can navigate without difficulty" as* can be seen in item 3 and 10 with the same category mean of 4.98. On the other hand, the item that was rated lowest by the respondents is "*Using the application is effortless."* Furthermore, it can be seen from the table that the category means 4.95 in qualitative ratings which implies that the participants "Strongly Agree" on the ease of use of the application.

Table 3. Ease of Learning Aspect

| Statement | Weighted Mean | Descriptive Equivalent |
|---|---|---|
| 1. The application can be learned to use it quickly | 4.97 | Strongly Agree |
| 2. The application can be easily remembered on how to use it. | 4.81 | Strongly Agree |
| 3. The application is easy to learn to use. | 4.94 | Strongly Agree |
| 4. Navigation through the application was easy | 4.92 | Strongly Agree |
| **Overall Weighted Mean** | **4.91** | **Strongly Agree** |

Table 3 shows that the mean assessment of the participants on the ease of learning of the application ranges from 4.81 to 4.97. It can be seen from the table that the highest mean ratings were given on **"***The application can be learned to use it quickly"*, *"The application is easy to learn to use it"* with a weighted mean of 4.97 and 4.94 correspondingly. Moreover, from the table above, the total weighted mean is 4.91 which implies that respondents "strongly agree" on the ease of learning of the application.

Table 4. Satisfaction Aspect

| Statement | Weighted Mean | Descriptive Equivalent |
|---|---|---|
| 1. The interface is simple but pleasant to the eyes. | 4.97 | Strongly Agree |
| 2. The application works the way the user wants it to work | 4.96 | Strongly Agree |
| 3. The application provides correct output. | 4.94 | Strongly Agree |
| 4. Graphical user interface is well designed | 4.96 | Strongly Agree |
| 5. Fonts (style, color, saturation) are easy to read | 4.94 | Strongly Agree |
| 6. The application is free from technical problems (link errors, programming errors etc.) | 4.81 | Strongly Agree |
| 7. The application is enjoyable and interesting | 4.96 | Strongly Agree |
| 8. The application is easy to install. | 4.75 | Strongly Agree |
| **Overall Weighted Mean** | **4.91** | **Strongly Agree** |

Table 4 shows that the mean assessment of the participants on the ease of learning of the application ranges from 4.75 to 4.97. The highest mean rating was given on *"The interface is simple but pleasant to eyes*". On the other hand, the item that was rated lowest by the respondents is "The application is easy to install". This could be attributed to the device storage of the mobile phones used by the users. However, the total mean assessment in all the items of satisfaction aspect have qualitative ratings that are described as "Strongly Agree".

**Table 5 Summary of the Four Aspects of Usability**

| USABILITY ASPECT | Weighted Mean | Descriptive Equivalent |
|---|---|---|
| 1. Usefulness | 4.91 | Strongly Agree |
| 2. Ease of use | 4.95 | Strongly Agree |
| 3. Ease of Learning | 4.91 | Strongly Agree |
| 4. Satisfaction | 4.91 | Strongly Agree |
| **Overall Weighted Mean** | **4.92** | **Strongly Agree** |

Table 5 shows the summary of the four aspects of the Usability of the developed application where the mean assessment ranges from 4.91 to 4.95. The highest mean ratings were given on *"Ease of use"* while "usefulness", "ease of learning" and "satisfaction" were rated the same mean ratings of 4.91. Furthermore, it can be seen from the table that the mean assessment in all of the four aspects of Usability have qualitative ratings that are described as "Strongly agree"

and the category mean of 4.92 which implies that the participants “Strongly Agree” on the Usability of the developed application.

## CONCLUSIONS

The developed mobile-based language translation integrating the components of Knowledge Based System, Inference Engine and User Interface has met all the functional requirements as it can translate words from Ibanag to Tagalog and English; and search facility for easy retrieval or viewing of words and a storage facility for the list of Ibanag words. As regards to the Usability of the developed application as assessed by the participants, the study revealed that all the prescribed aspects of usability (e.g usefulness, ease of use, ease or learning and satisfaction) had been complied to a “Strongly Agree”. The participants during the evaluation of the application showed interest, enthusiasm and appreciate the usefulness of the mobile-based translation application to the language learners as it can translate the Ibanag words to Tagalog and English with related words. According to reference [7] cited by [5], they elaborate that aside from the good effects of translation such an aid to language learning, it also helps create and maintain good relations between teacher and student for it facilitates classroom management and allows students to maintain their own sense of first language identity, while also building a new bilingual identity.

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