

EasyTrans: Accessible Translation System for Blind Translators

Dina Al-Bassam¹, Hessah Alotaibi¹, Samira Alotaibi², and Hend S. Al-Khalifa¹(✉)

¹ College of Computer and Information Sciences, King Saud University, Riyadh, Saudi Arabia
hendk@ksu.edu.sa

² College of Languages and Translation, King Saud University, Riyadh, Saudi Arabia

Abstract. This paper presents the design and implementation of EasyTrans, an accessible translation web application system for Blind Translators (BT). EasyTrans runs entirely on a web server and utilizes many web services, allowing BT users to perform their translation tasks online, thus relieving them from installing any software. EasyTrans has a simple and intuitive user interface with several dictionaries to support BT in their translation tasks. Usability evaluation of EasyTrans showed that BT were satisfied by its performance and provided further suggestion for enhancement.

Keywords: Accessibility · Translation accessibility · Visual impairment · Blind translators

1 Introduction

Blind translators who use technology do more than sighted people could ever imagine, as they can translate with technology anywhere and anytime. Nevertheless, fully understanding this issue is reflected in the growth of facing many challenges regarding their techniques of translating texts. One of these challenges is that blind people start scanning and skimming texts without having a highlighting tool. They pick every difficult word and look for it in electronic dictionaries and websites on the Internet, which of course, adds a heightened degree of difficulty during translation. In addition, blind translators have to check many different online pages at the same time in order to locate the suitable equivalent word, therefore, repeating this process frequently can make blind translators, for certain, feel frustrated and tired.

When the methods blind people use are compared to the methods sighted people use, it is clear that blind people tend to consume more time, need more focus, and exert more effort as a result of not having paper dictionaries or a reachable comprehensive website for all their translation needs. Furthermore, if they must use paper dictionaries as sighted people do, they have to look for a worthy and qualified person to read to them, which no doubt decreases their independence. Also, existing commercial translation tools such as SDL Trados Studio has been reported inaccessible (<http://goo.gl/aFKaDV>).

Therefore, taking the previous issues into consideration, a translation system, which is user-friendly and easily accessible, is needed and vital to the process of translation for people facing visual impairment and blindness. In this paper, we present the design

and implementation of EasyTrans, an accessible web translation system targeting Blind Translators (BT). EasyTrans runs entirely on a web server and utilizes many web services, allowing BT users to perform their translation tasks online, thus relieving them from installing any software.

2 EasyTrans System

EasyTrans system is based on User Centered Design (UCD) approach. We relied on the participation of a blind translator in all phases of our system design. The blind translator was involved in the first phase of the project by helping eliciting the system's functional requirements. After that, the blind translator was involved in testing each component in the system and providing the proper feedback in terms of usability and accessibility. Furthermore, the blind translator suggested many modifications that we fixed accordingly. Finally, the complete system was tested and evaluated again by another set of blind translators to verify that the system works as expected. Next, we explain in details the different system components.

2.1 Interface Design

EasyTrans interface (<http://trans.computing.edu.sa>) applied WCAG 2.0 guidelines provided by W3C [1] as follows:

1. **Text alternatives:** Each image has an alternative name that describes it.
2. **Ordering content in a meaningful sequence:** HTML elements and the system's contents are structured in a meaningful sequence that makes the blind user grasp the content quickly and easily.
3. **Use headings:** each system page uses headers to simplify the navigation between contents.
4. **Keyboard accessibility:** each element can be accessed by an access key.
5. **Bypass blocks:** each error message used in the system is a skip link; to let the blind user read it and navigate directly to the area that has the error.
6. **Focusing on content:** the system will automatically focus the blind user to the result of the fired action by using JavaScript focus function (i.e. if the blind user translates a word, the system will focus on the translation result area to immediately read it).
7. **Mobile compatible:** the system is designed using web responsive design approach to be compatible with any mobile device.

2.2 Used Dictionaries

As part of the system requirements, we asked the blind translator to recommend a list of online dictionaries that are used during the translation task. Lists of seven dictionaries were recommended. However, while inspecting if the recommended dictionaries provide proper REST APIs to integrate with our system, we found that only some of them can support this feature. Therefore, as a first phase of the project, we used "Glosbe"

and “Google Translate” dictionaries. The system currently only supports Arabic/English languages. However, it can be expanded in the future to include more languages.

2.3 System Functionality

EasyTrans targets two types of users (registered and unregistered). Both users can set the translation language, display dictionaries that support the selected translation language, highlight difficult words or sentences in the original text and export the translated text. However, the only added function for registered users is the ability to save the translation text for later editing. Thus, EasyTrans provides three main services as follows:

1. **Translator:** as a first step in the translation process, the blind user will set the translation language (e.g. From: English To: Arabic). Then, (s)he will select the dictionaries from a list which supports the chosen translation languages. Finally, the user is ready to translate and whenever (s)he translates a text, the system will focus on the translation result area by using the JavaScript focus function to allow the screen reader to immediately read it.
2. **The highlighter function:** provides an accessible way for the blind translators to highlight any text. First, they paste the whole text to be translated into the original text area. Then, they skim the text using their screen readers and highlight difficult words by adding the following symbols “@” and “*” before and after the designated word and click on highlight. The system will loop over the text and fetch all the words that are between the @ and * symbols. Then, the highlighted words will be displayed as a list beside the original text area.
3. **Editor:** While the user is highlighting and translating difficult words, (s)he can use the editor to write the translated text. The editor allows the user to export the translated text as a pdf or txt file where the user can save the whole work for later editing (if (s)he is logged into the system).

3 EasyTrans Evaluation

In EasyTrans system, we used two approaches for evaluation. The first approach is by using the AChecker tool (<http://achecker.ca>) to check the system accessibility. Also, it displays recommendations and observations to reach the proper accessibility level. When using the AChecker tool it did not detect any accessibility issues on EasyTrans system, which indicates that it is accessible.

The second approach is by conducting a usability study on blind translators who had no previous knowledge of the system. Four blind translators participated in the evaluation; they were female undergraduates, between the ages of 21 and 24 years old. Voice-over was used to read the system content.

After accomplishing the tasks, we asked them to fill out a System Usability Scale (SUS) questionnaire [2]. The obtained average score results of SUS for all participants was 87.5 %; this indicates that EasyTrans system gained participant satisfaction.

Summarizing the results of the usability evaluation, users mentioned a handful of small changes in regards to the user interface; in fact we received the same comments from the evaluators regarding the different text areas in the translation step. The areas were not labeled for easy identification. Also, one of them suggested having an instant translation for highlighted words. In addition, they suggested having a mobile application for the system.

4 Conclusion and Future Work

EasyTrans is a system that targets blind translators by providing the necessary tools needed for a translator to accomplish his/her task easily. The system guarantees the accessibility and the usability for the blind translators by integrating and providing all the needed translation dictionaries in one accessible system.

Evaluation of the EasyTrans system showed that it has a simple and user-friendly interface that supports BT in their translation tasks. However, EasyTrans system is still in its early stages of development; in the upcoming version we will search for ways to integrate dictionaries which have no APIs with it to enrich the dictionary support. We will also expand the functionality of the system to include grammar and spell checkers, translation memory and collaboration features. Furthermore, we will assert the usability of EasyTrans by conducting more extensive user study. The study will target a larger number of blind translators with varying previous knowledge of translation.

References

1. Caldwell, B., Cooper, M., et al.: Web Content Accessibility Guidelines 2.0. W3C Recommendation (2008). <https://www.w3.org/TR/WCAG20/>
2. Brooke, J.: SUS-A quick and dirty usability scale. *Usability Eval. Ind.* **189**(194), 4–7 (1996)