

English to Zambian Local Language Translator

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ABSTRACT

When a child is born, it is first introduced to the mother language which will be the main communication language that the child will understand. The informal learning processes will begin in the child's life with the first language. Therefore when that child is introduced to the formal learning environment where learning is conducted in the official language (English) which is the second language to the child, it becomes very difficult for both the teacher and learner to understand each other. This made the literacy levels for school going children to be very low. According to the new Zambian curriculum, Zambian local language is to be conducted from grade one to grade four in all the subjects' areas. Meaning all teachers teaching grades one to four are supposed to teach in the local language of that area regardless whether they know the language or not. This has become difficult for the teachers to interpret their lessons from English to local language for their understanding. Hence this research will come up with a system that will help the teacher in interpreting the English words to a specific local language.

CHAPTER 1

INTRODUCTION

Zambia has gone through so many reformations in the past years; among them is the change of the curriculum in 2013 which resulted in primary schools' teachers to use official local language when teaching from grade 1 – 4 in all the subjects. On the other hand the curriculum and the syllabus are prepared in English and are to be taught in the local language making it difficult for teachers who are not very conversant with the same language to deliver effectively. The issue of literacy in Zambia has, for some time been a subject of concern due to the low literacy levels observed among Zambian pupils, particularly those in public primary schools. After realizing that using English as the language of instruction, particularly at the primary level, did not enhance educational gains (MoE, 2003), it was decided that initial literacy be done in a local language predominantly spoken in an area (MoE, 2012). The teaching of initial literacy using the local languages was advocated for because of the low reading levels among learners in Zambia. Presently, initial reading in Zambia is done in the officially recognized local language of the region where the school is located. There are seven officially recognized Zambian languages: Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja and Tonga.

Basically when a child is born; he/she is first introduced to the mother language which will be the main communication language that the child will understand. The informal learning processes will begin in the child's life with the first language. Therefore when that child is introduced to the formal learning environment where learning is conducted in the official language (English) which is the second language to the child, it becomes very difficult for both the teacher and learner to understand each other. This makes the literacy levels for school going children to be very low. According to the new Zambian curriculum, Zambian local language is to be conducted from grade one to grade four in all the subjects' areas. Meaning all teachers teaching grades one to four are supposed to teach in the local language of that area regardless whether they know the language or not. This has become difficult for the teachers to interpret their lessons from English to local language for their understanding. The system will help the

teacher in interpreting the English words to a specific local language. The main objective of this system is eradicating the language Barrie between the teacher, learners and the curriculum.

1.1 PROBLEM STATEMENT

It has been discovered that most of the teachers both in private and public schools teaching lower classes have problems in interpreting the local language to English and vice visor. This has hindered progress in the education fraternity, this has brought about many problems which includes; misleading interpretation, time wastage, maintains the problem, manual work, reputation of the problem, skipping some topics due to failure in interpreting the language to suit the learners understanding.

1.2 PROJECT OBJECTIVE SPESIFICATION

The language translator, an interactive web-based application that creates an interface between the curriculum developers and the teachers will enables the teachers find it easy in preparing for the lessons to be taught in class. (Author, 2018)

1.3 GENERAL OBJECT

The language translator aims at reducing the workload of a teacher in the teaching fraternity. Currently teachers have to use their own sources for interpreting words from English to local language. The objectives of this proposed web application system are:

- To interpret local language to English language.
- To enhance learning in a Zambian primary school
- To Send information with no distortion
- To Help a teacher in lesson preparation

1.4 PROJECT OVERVIEW

The system will give teachers an overview of all the words to be taught and interpreted and all lessons to be covered in class and in all the subject areas, and teachers are to translate them in local language required. With this system in place, everything will be made easy for the teacher to prepare.

English – local language translator system was developed as a one stop portal to offer translation services and eradicate the traditional way of teachers depending on learners / unprofessional personnel in translating text for them. The system has been developed with an offline accessible database to easy the retrieval and storage of information on users.

1.5 AIM OF PROJECT

The main aim of this project is to eliminate the language Barrie between a teacher and the new Zambian curriculum, the teacher and the learner. The project is also aimed at improving the searching of information in our local language, thereby reducing the cases of teachers getting wrong information. It will also provide the teachers with quality and professionally interpreted information.

CHAPTER 2

2.1 LITERATURE REVIEW

According to Aiwei, S. (2005) says there is a lot of translator software on the market that can help one translates from one language to another. These include; Google translate Microsoft translator, iTranslate and iHandy translator among them. Google translate as for March 2016 supports 103 languages the existing system that is currently mostly used is the Google translate. This is a free multilingual machine translation service developed by Google to translate text. It offers a website interface, mobile apps for Android and iOS and an API that helps developers build browser extensions and software applications. EMily Schiola (2015) says Google Translate supports over 100 languages at various levels and as of May 2017, serves over 500 million people daily Google Translate is based on something called "statistical machine translation". This means that they gather as much text as they can find that seems to be parallel between two languages, and then they crunch their data to find the likelihood that something in Language A corresponds to something in Language B. This method works to some extent for language pairs where a lot of more-or-less parallel data is available, for example English-Spanish. However, it fails completely when such data is paltry or non-existent, as is the case with most language pairs. For most pairs in the Google Translate set of 80 languages, they go from Language A to English, then from English to Language B, with predictably unintelligible results. Zanettin, F. (2000). Also adds that the other way that you could say Google Translate "works" is that it often meets its users' expectations. If you feed something into the program, you are not expecting to get a perfect translation. You are expecting to get something that will clue you in to the intent of the original. Since you are getting something for free that gives you better understanding than you would have had otherwise, the translation often "works" for you. However, if you were to use the service for translations that your business depended on, without post-editing, you would run far too much of a risk of total failure - the people receiving your translations would not be reading them with your same mindset of "better than nothing", and would therefore wonder why you were sending them sometimes incomprehensible gibberish.

BROWSER INTERGRATION

Google Translate is available in some web browser as an optional downloadable extension that can run the translation engine. In February 2010, Google Translate was integrated into the Google chrome browser by default, for optional automatic webpage translation. Jaaskelainen, R., (2005).

CONCLUSION

The overall approach of Google translate is using statistical translation that means that the system is trained with large number of parallel text, that is text where there are human translated version. Basically Google translation uses techniques called as overall simplification model. The data base is flooded with millions of translation of different languages by humans for example a book written in English and translated in Hindu are inserted in a machine, and an algorithm then find pattern in it. Now based on quantity data algorithm translate it by detecting patterns in documents that have already been translated by human translator, (books those are translate are examples of human translator) translation quality is produced by algorithm. Machine translation can never be a substitute for human translation because a language can be used for non-communication reasons like expressing emotions, demonstrating one's class status, telling jokes, expressing non hostile intent with strangers.

Our Zambian local languages have a disadvantage to this form of translation because most of the local languages are not well documented or later on translated. In as much as their morphology can be easy learnt, their practical use largely grounds on implicitly rather explicit meaning. In best cases, it is contextual rather than specific. The use of idiomatic phrases is quite common in Zambian local language in their raw and traditional basic forms.

As far as accuracy of machine translation is concerned, any claim can be misleading as there is no perfect way of quantifying accuracy. A language can be graded as perfect English, minimally acceptable English and so on and these are subjective and cannot be quantified easily. Also even those machine translations that claim 90% accuracy will have one error in every line.

In conclusion, machine translations can only assist in improving the translator's productivity by increasing translation speed and the translation quality cannot be by itself a substitute for quality human translation.

2.2 FEASIBILITY STUDY

2.2.1 PROPOSED SYSTEM

The proposed language translator is a web-based system, which will facilitate the education system to offer its services offline. The language translator will enhance the use of Creative and Communication Technologies. The proposed system is expected to:

- Better the access to information, language translator system was developed to make information readily available 24 hours in all subjects
- provide specific information of word meaning requested
- Not fail at any time
- Easy to the end user.

Historically the curriculum of the Zambian education system has a 7-5-4 structure, namely 7 years at primary school, 2 and 3 years at junior and higher secondary school respectively, and 4 years at university for undergraduate degrees. While the intention is that school education should be mandatory for all, sadly many poorer children drop out along the way due to different reasons. Besides that learning continues normally in all learning institutions

The use of this translator will enable the education system to help teachers and learners find it easy to interpret the seven local languages into English. It can provide significant benefits for government in the delivery of more effective and efficient information and services to all teachers across the country. It will enable teacher deliver their lessons with confidence.

The country aims at eradicating poverty levels through providing quality education to all. This system can also help in increasing the levels of literacy. The use of computer technologies in

education has enabled teachers to simulate final outcomes and assist students in applying knowledge learned from textbooks, there by compensating for the deficiency of traditional teaching methods. It is important to examine how effective these technologies are in practical use. This study is developed learning – teaching resources platforms using the computers in an easy touch user interface, in order to help in interpreting the languages.

The language translator will also encourage the teachers in the use of computers for reference of information in their daily lesson planning. Thereby making them become more conversant with the use of computers. The teachers own pedagogical belief and values plays an important part in shaping technology mediated learning opportunities and the knowledge acquired using this system change the way teachers and pupils interact with each other and with the task.

The confidence of the teacher in her lessons gives a positive reaction towards the lesson. Few teachers are confident in using a wide range of ICT resources, and limited confidence affects the way a lesson could be conducted. Means (1994), “the primary motivation for teachers to use technology in their classroom is the belief that some technology support superior forms of learning” this means that teachers play a very crucial role in learning on how to work with technology. Many teachers still fear some forms of technology, which prevents them from making use of them in their teaching and lesson preparations. This system will give some teachers a feel on how information can be searched using technology way

CHAPTER 3

METHODOLOGY

3.3 Design and Test Steps

The methodology based on System Development Life Cycle (SDLC), generally has three major step, which is planning, implementing and analysis. EMily Schiola (2015)

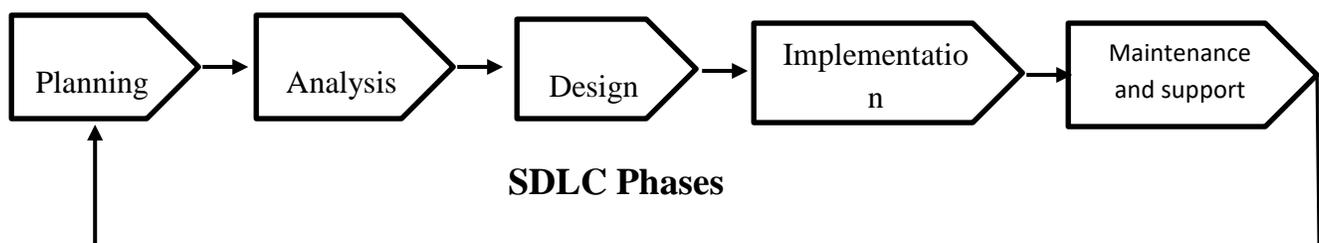
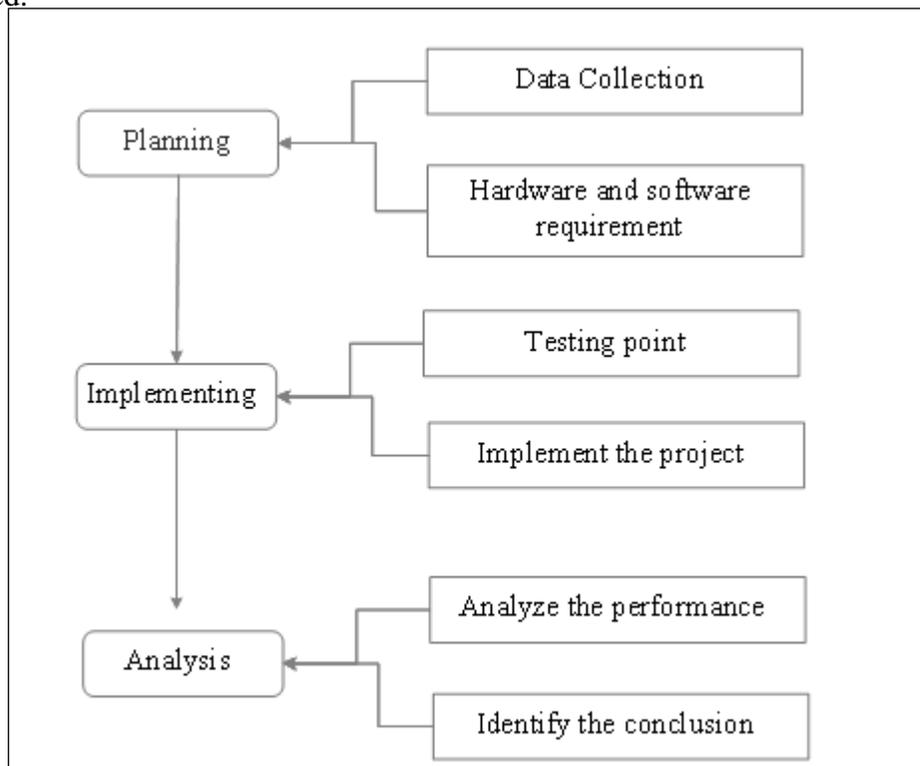


Figure 6: SDLC phase

This final year project used three major steps to implement project starting from planning, implementing and testing. All the methods used for finding and analyzing data regarding the project related.

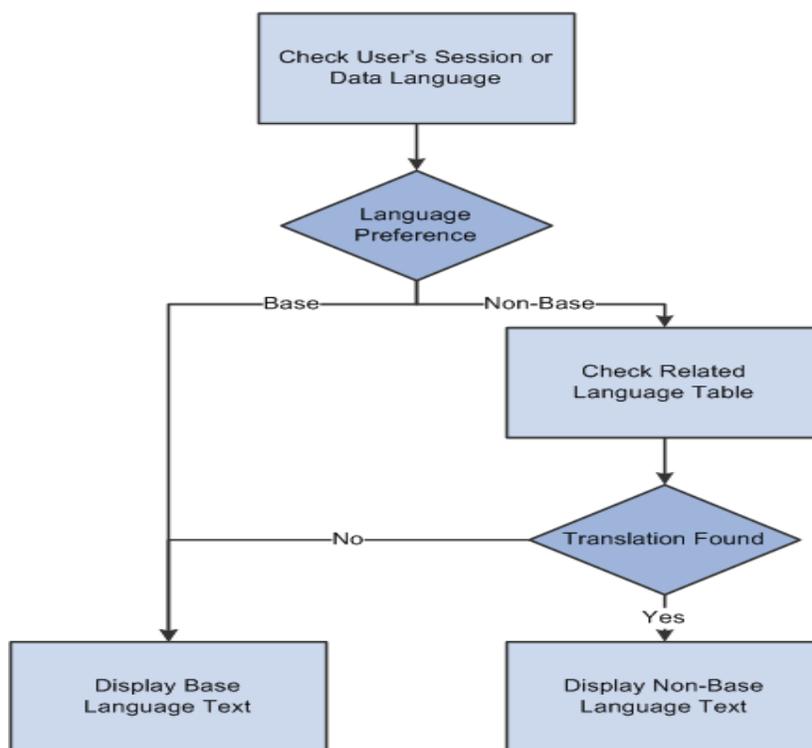


3.2. FLOWCHARTS

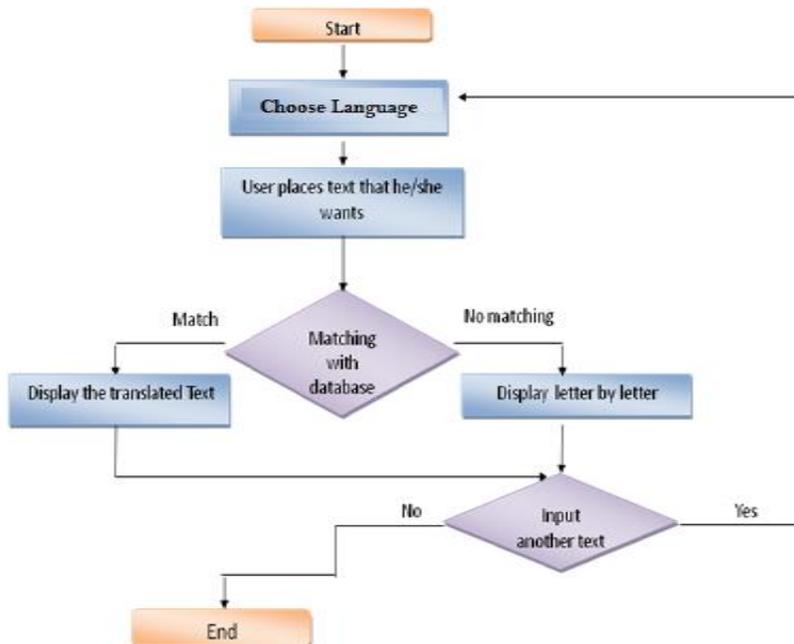
3.2.1 System Flowchart

The flow chart below shows how the language translator will be operating from the time a person logs in to the till the output of the searched term. Initially before pursuing the project, a system flow was prepared in order to answer the following questions:

- i. How will data flow in and Out of the system?
- ii. How to maintain relationship between different data?
- iii. What will be the different milestones data will travel from start to end?
- iv. To understand these questions and assess the requirements, pictorial representation was prepared which is given below in Figure



3.2.2 Data Flow Diagram



3 SYSTEM ANALYSIS AND DESIGN

3.1 System Specification

i. Server side: PHP 5

The English – local language translator system was developed on PHP framework as the server side script, in order to provide the dynamic features of the system.

ii. HTML, JavaScript, CSS

The system uses HTML, JavaScript, and CSS to present the style of the web pages. This is to provide both static and dynamic outputs of the web page.

iii. Database: MySQL

For the database, the system uses MySQL database which is an open source SQL database to store all data which communicates with the application on the server (Apache Server). MySQL was used for easy integration with PHP.

iv. Apache Server.

A Web server is a server that is responsible for accepting HTTP requests from web clients and serving them HTTP responses, usually in the form of web pages containing static (text, images etc.) and dynamic (scripts) content. The Apache Web server has been the most popular and widely used Web server for the last decade. It is used by approximately 50% of all websites. Apache is cross-platform, lightweight, robust, and used in small companies as well as large corporations

3.1.2 Architecture

The whole system is divided into server-side component (Backend) and client-side component (Frontend).

a) Front teacher-side component

The whole system is divided into server-side component (Backend) and client-side component (Frontend).

b) End user facing view: teacher

The end-user facing view is the interface for the end user to interact with the system, including daily operation, such as searching for a word. The pages of this part include:

- i. Homepage
- ii. Searching a word
- iii. About me

c) Super-user view

The super-user view is the interface for administrators to manage the data entry, availability and security of the information processed by the system. The pages of this part include:

- i. Home
- ii. Add words
- iii. My library
- iv. View request

3.3.2 FUNCTIONAL REQUIREMENTS

Authentication

Table 3: Admin login (Author, 2018)

Purpose	Admin login to system using existing profile
User	A user with an existing profile. An admin with an existing profile.
Input data	Profile username and password.
Output data	Corresponding page data.
Pre-condition	User is not logged in to a profile, input profile exists in database, and user password matches profile.
Post-condition	Users computer has been supplied with appropriate cookie page, page data is appropriate for selected profile.
Basic flow	Add new words, make changes to the database respond to the teachers query

Table 4: Teacher log in (Author, 2018)

Purpose	Teacher login to system using existing profile
User	A user with an existing profile. An admin with an existing profile.
Input data	Profile username and password.
Output data	Corresponding page data.
Pre-condition	User is not logged in to a profile, input profile exists in database, and user password matches profile.
Post-condition	A user computer has been supplied with data is appropriate for selected profile.
Basic flow	Search for words to be translated Sends requests if words not available

EXPECTED BENEFITS

The system will be user friendly and will offer easy access to information as the user wants to translate. The system will allow the admin to add any new words that can be requested by the user if not available in the system. It will also have expression of the word used in a sentence for further understanding. Teachers will not have to spend so much time in searching for a person who can help him/her in translating a word in local language.

Most teachers who are not familiar with the local language have been misled by giving them false interpretation and in the process some learners acquire wrong information. This system will deliver authentic information from professional translators employed by the government. It will also solve the language barrier between teacher and the students and in hence good and Effective communication between teachers and the curriculum syllabus. The system will complete automation of all operations and will have centrally stored information with zero redundancy. The translating system will increase the Frequency research for the teacher and easy understanding of language.

CHAPTER 4

4.1 RESULTS

Figure: 4 log in output (Author, 2018)

The figure below, show the output of the algorithm and coding in the appendix. The administrator logs in through the admin login and the teacher logs in through the teacher log in burton in order to access the system.

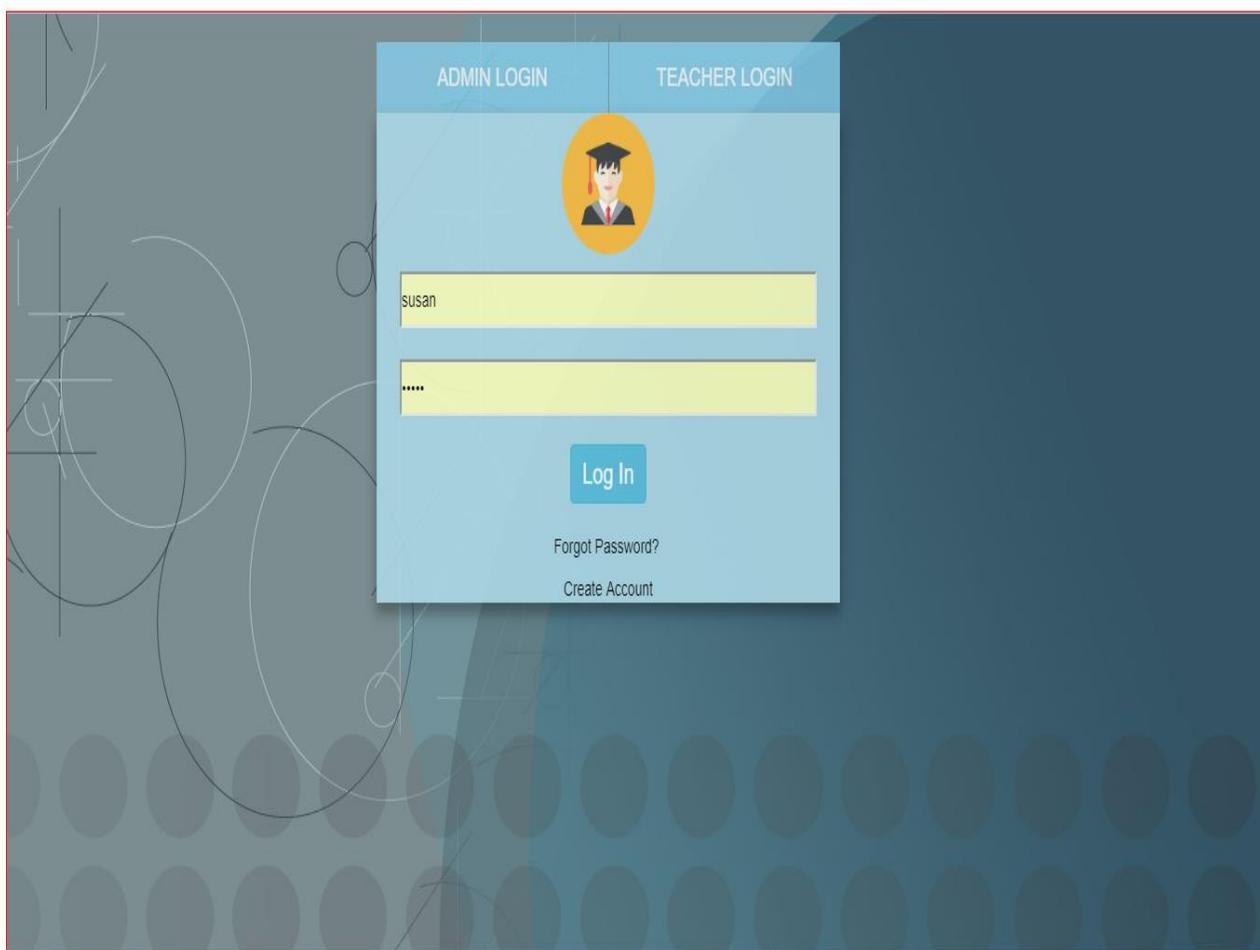


FIGURE 5: ADMINISTRATOR HOME CONTACT (Author, 2018)

This shows the output for the administrator, in this interface the administrator is able to add words to the system, view the words added to the system in the library page. The admin will also view the requests sent by the teachers. In the catalogue the administrator will be able to see how many words have been added to the system.

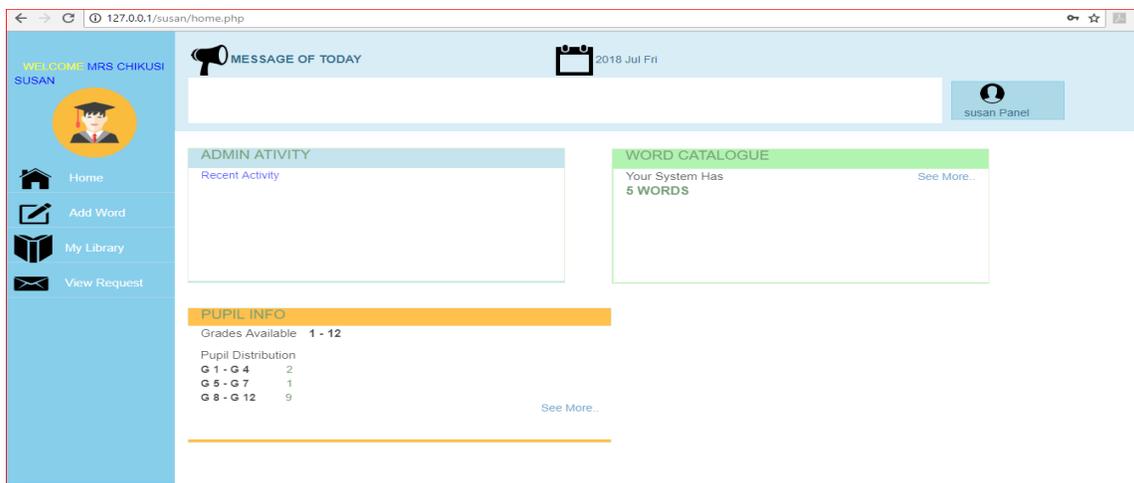


FIGURE 6: PERSONAL DETAILS OUTPUT (Author, 2018)

This output shows the interface of the teacher's page, this interface allows the teachers to view their details entered in the system. The teachers will also use this interface to search for information using the search button.

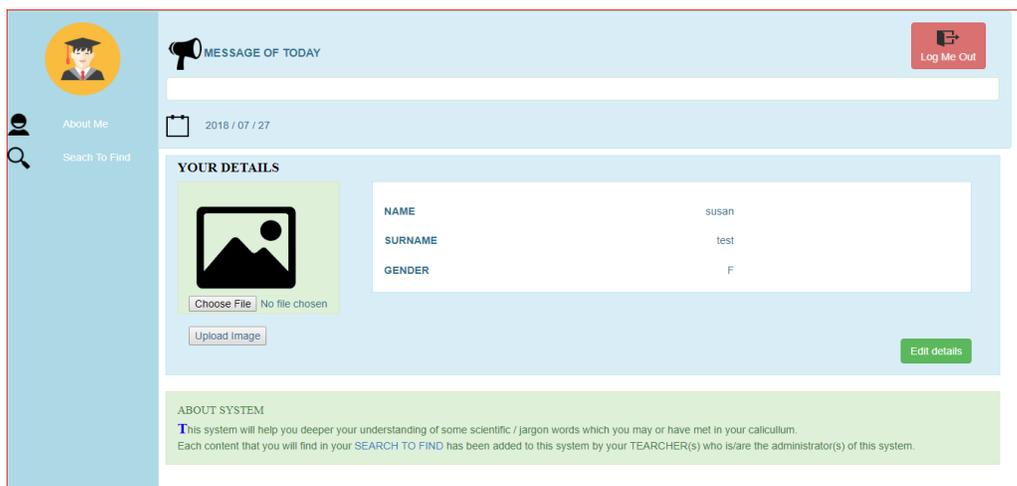


FIGURE 7: ABOUT SEARCH OUTPUT (Author, 2018)

This is the administrator interface which shows the library of words put in the system. Once the admin included the words into the database it reflects in the library, the library will show the number of words found in each grade.

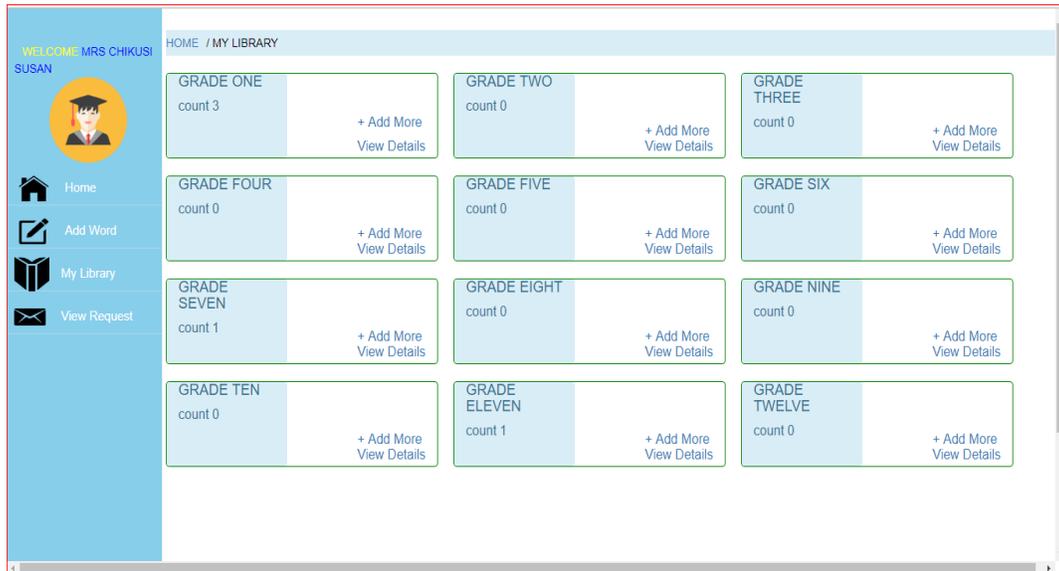


FIGURE 8: ACCOUNT OUTPUT (Author, 2018)

This interface shows the output system where the administrator will be able to add the users to the system.

The screenshot shows a 'Create Your Account Here' form. It includes the following fields and options:

- Name***: Text input field with placeholder 'Enter Your Name'.
- Surname***: Text input field with placeholder 'Enter Your Surname'.
- Select Grade***: Dropdown menu with 'Grade' selected.
- Password***: Text input field with placeholder 'Input Your Password'.
- Repeat Password***: Text input field with placeholder 'Repeat Your Password'.
- Select Gender***: Radio buttons for 'Female' (selected) and 'Male'.
- Pick Date Of Birth***: Text input field with placeholder 'mm/dd/yyyy'.
- Recovery Question**: Section header with subtext 'Recovery Question Helps You To Recover Your Account In Case You Forgot Your Password'.
- Recovery Question***: A checked checkbox for 'Who is your class teacher?' followed by a text input field with placeholder 'Answer'.
- Create**: A blue button.
- Cancel**: A red button.

CHAPTER 5

5.1 LIMITATIONS

In this language translator, the main challenge that could not make the information reach the teachers is the availability of computers in the schools. At least a school should have a computer present in the school premises. Besides that the system is designed in such a way that only an administrator can add words to the system. Therefore only the administrator can make changes to the information in the system. The translator system has only text translation functionalities. Other language processing functionalities such as speech recognition, language detection are not supported in this system currently.

5.2 RECOMMENDATIONS

Taking into consideration that technology living is booming in the today life, I would like to recommend that the government should put first priority in increasing the use of technology in learning institutions in order to improve the literacy levels in the country. The use of this system in schools will improve the teacher's efficiency in lesson preparation and pronunciation of new words introduced to a teacher in a particular language. This project has room for further development and improvement. Finally, we can say that the English-local language translator is ready for implementation and will surely provide the schools with professional offline translation of all word found in the syllabus and learners text books. The database will have to be updated as more words will be added. Furthermore, since this system depends upon computer hardware and software, it's very important for the schools which would like to implement the project to first acquire or purchase computers in their schools.

5.3 CONCLUSION

Translation is a complex task that demands expertise, it offers three indispensable functions that man constantly needs. With such great and crucial responsibility only professional translators have the ability to do so. The system presented in this project will highly give help to a teacher in need of interpretation of information to be learned. A teacher will be guaranteed of getting accurate word translation and pronunciation, making it easy for a Zambian teacher to prepare his/her lessons with fewer difficulties. The system will be continuously improved by the employed personnel by adding more words to the system. Translation has important role in globalization of culture especially pop culture which causes to give advantages of the source culture, knowing the habits and customs even religious customs. The use of this system in schools will positively encourage most educationalists to use the computers installed in their schools on a daily basis.

REFERENCE

- [1] A. Black, P. Taylor, and R. Caley, "The Festival speech synthesis system," <http://festvox.org/festival>, 1998 Accessed 3rd July 2018.
- [2] <http://books.google.com.au/books?id=jAUWpUrtW8cC&pg=PA182&dq=%22translation+categories%22+literal+literary&hl=en&sa=X&ei=Y2oNVJSeOJXm8>
- [3] Aiwei, S. (2005). Translatability and Poetic Translation. Retrieved September 9 2014 from <http://www.translatum.gr/journal/5/translatability-and-poetic-translation.htm>
- [4] Chris Callison-Burch. Machine translation: Word-based models and the EM algorithm [online]. United States : John Hopkins University; 2007 URL : <https://www.cs.jhu.edu/~jason/465/PowerPoint/lect32a-mt-word-basedmodels.pdf> Accessed 23 July 2018
- [5] EMily Schiola. Top 5 Best Translator Applications [online]. Heavy, 2015. URL: <http://heavy.com/tech/2015/04/best-translation-translator-application-voice-iphone-android/> Accessed 28 May 2018
- [6] Harvey, M. (2003). A beginner's course in legal translation: the case of culturebound terms. Retrieved April 3, 2007 from <http://www.tradulex.org/Actes2000/harvey.pdf>
- [7] Jaaskelainen, R., (2005). Translation studies: what are they? Retrieved November 11, 2006 from <http://www.hum.expertise.workshop>.
- [8] L.G. Kelly. The True Interpreter: a History of Translation Theory and Practice in the West. New York: St. Martin's Press. 2001.
- [9] M. Emmitt, M. Pollock. Language And Learning: An Introduction For Teaching (2nd). Melbourne: Oxford University Press, 1997.
- [10] Manchishi, P. C. (2004). The status of Indigenous Languages in Institutions of Learning in Zambia: Past, present and future. The African Symposium, Vol. 1.
- [11] Ministry of Education. (2003). Learning achievement at the middle basic level: Zambia
- [12] Ministry of Education. (2003a, 3rd edition). Zambian New Breakthrough to Literacy. national assessment survey report (2003). Lusaka: Examinations Council of Zambia. Primary Reading Programme. Teacher's Book. Grade One.
- [13] Rita El Khoury. Microsoft Translator And Google Translate Compared: Is There A New Challenger In The House? [Online]. Android police, 2015. URL: <http://www.androidpolice.com/2015/08/09/microsoft-translator-andgoogle-translate-compared-is-there-a-new-challenger-in-the-house/> Accessed 10 March 2018.
- [14] UNESCO. (2003). Local and indigenous knowledge systems. "World summit on sustainable Development". DFID. http://www.unesco.org/sc_nat/ev.php, retrieved 27/07/2018
Zambia. PhD Thesis, University of Zambia
- [15] Zanettin, F. (2000). "Parallel corpora in translation studies: issues in corpus design and analysis", in Olohan, M. (ed.) Intercultural Faultlines. Research Models in Translation Studies I. Textual and cognitive aspects, Manchester: St Jerome. 93-118