Cloud based Multilingual Web Translator Engine for Banking Services

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Abstract— Multilingual websites are popular and more useful to local. The special characteristics of multilingual software are compared with the existing three multilingual websites. The functional architecture of the proposed system, CMWTEB is presented and its multilingual features meet the requirements of the customer in their own preferred languages in banking service.

Keywords—Adaptability, cloud computing, language neutrality, multilingual software, reusability

I. INTRODUCTION

Communication technology connects the world people to share their information among them easily through internet. Internet makes many things simple for user and also service provider. It provides lot of information in different format like audio, video, text data into different languages. In early days, computer is accessible by the person who knows English language only. Even many electronic gadgets are provided the facility to access by those who know English language. Globalization of software made many software companies to extend their services in complete form to all users who know different languages. To increase their business market software company decided to develop the software with more than one language.

Software which supports more than one language is multilingual software. The natural language available in the world can be categorised widely into two. The languages in Europe countries such as English and French have similar features and are homogenous languages. So the multilingual software development for homogeneous languages is less complex than the software developed for heterogeneous languages (i.e. language with different features such as English and Hindi, English and Arabic). In early stages of multilingual software development, software was developed in bilingual and the character sets was defined by the individual developer on their own way. The requirement of universal character set has become more important after development of World Wide Web. A global character set called Unicode is defined in such a way to support multilingual users and organizations for international standards. Unicode character set allows the people to use computers in any language. Unicode has made software internationalization in many operating systems and World Wide Web[1]. The expectation of the multilingual software is increasing. There are many internet websites are available to help many users to access the information like news on their preferred languages. The services provided by the Government or Public sectors in country like India, having more than one official language, are to be in multilingual.

India's Independence Day on 2014 the Prime Minister of India announced *Jan Dhan Yojana* scheme to open a zero balance account in a bank for every family living in India. Government of India has decided to provide the financial assistance to the person through bank account directly. All private or public banks provide services to the customer in more than one language in India. The Automatic Teller Machine (ATM) provided by the banks in India will operate with multilingual features having two languages (English and Hindi) or three languages (English , Hindi and the third language as the regional language). By providing banking services in multilingual in country like India makes the ease of use by common man in their own languages. Making all services to the user (client) on Internet (online) in multilingual is the best way to reach all in country like India. Reliable and low cost multilingual service in bank can be achieved by implementing cloud computing. Survey on few existing multilingual software providing services to the user on internet is presented in section II. The proposed system, cloud based multilingual web translator Engine for Banking services, is described in section III. In section IV and V of this paper includes the conclusion of the proposed system and the summary of this paper respectively.

II. SURVEY ON MULTILINGUAL SOFTWARE

Multilingual software is the software which support more than one language and allow the user of the software to select the preferred language dynamically (at run time). English language is the only language used for officially to communicate between the states in Country like India even though country has many languages. Each state has their own portal and designed to support multilingual in their website. There are many websites developed to serve the locales in each state by providing their sites in multilingual. Few of them are presented in this paper and the multilingual software qualities are listed.

Bhoomi is the first e-Governance system designed and implemented for land record management in the local language, Kannada and English in the state of Karnataka and later implemented to other states in their respective

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languages [2]. Bhoomi is jointly developed by Government of Karnataka and National Informatics Centre, Karnataka for the common man in the year 2001. Bhoomi uses Unicode system to handle multiple languages. To improve the security, Bio-metric authentication, PKI (Public Key Infrastructure) enabled database and digital signatures are used. Bhoomi software is integrated with other software such as Kaveri (land registration software used in Karnataka) and also with bank.

aAQUA (almost All QUestions Answered since 2003), project of Indian Institute of Technology-Bombay (IIT-Bombay) and a part of Development Gateway India Research Center, funded by Government of India for Indian farmers to get advice from the agriculture experts [3]. aAQUA is an online discussion forum with multilingual and multimedia to the formers with agriculture experts to access the website in their mother tongue(Hindi, Marathi etc). aAQUA is implemented with three tier architecture such as presentation tier, web and business logic tier and database tier. Java technology (Java Server Pages/Servlets) is used to build the aAQUA and uses Oracle 9i Unicode UTF-8 database[4]. On user query the system refers by semantic search to the corpus and responds to the query if found in the stored answers by translating into the language of query. If the query is not in the corpus a new post is registered into the database.

Vidyanidhi is one of the digital library available in India, in English and a set of Indic languages [5]. Technology Development for Indian Languages (TDIL) introduced by the Department of Information Technology (DIT), Govt. India is for have an access to information in Indian languages by developing tools and providing technology. This activity is done with the help of Centre for Development of Advanced Computing [6]. Vidyanithi consist of two layers; metadata database and full text of theses. Metadata database is in multilingual with records in English and Indian languages. Vidyanidhi website searching will support English and Indian languages.

Software with multilingual features must have good functional qualities. Functional qualities reflect how well the software correctly performs the tasks for user requirements or specifications [7]. The five non functional qualities, modifiability, understandablity, reusability, adaptability and language neutrality are to be considered for multilingual software [8]. In modifiability of multilingual software in the language perspective is to add, modify and delete a component in the existing language and to remove an existing or to insert a new language. The clear representation of the language components based on the user requirements in the development of multilingual software improves the quality of understandability. The reusability allows some of the components of the multilingual software to be used with minimum change in order to include new language in the software. Adaptability means the software has to allow the user to work on their preferred language in multilingual software. The language neutrality of multilingual software is to develop the language independent software at domain level. All these qualities are to be considered while developing multilingual software. The existences of

multilingual qualities in the sample multilingual websites discussed above are given in the following table I.

A bank website contains information to customers about their services and also allows the customer to do the permissible transactions. The supporting documents submitted to the bank by the customer to get services (if needed) are not to be in one particular language. These documents have to be made available by translating the contents to language preferred by the user of the documents. The cost involved to provide the services to the customer on their preferred language have to be minimized. The cloud computing helps in many businesses by providing special features such as less investment by resources rent, low operating cost by allocating and de-allocating on demand, easy access to large scales for rapid increase in service and reduced risk and maintenance by outsourcing[9]. Cloud computing is a model for enabling on demand network access to a shared computing resources[10]. The cloud computing approach is proposed in banking services to enable multilingual features.

III. PROPOSED SYSTEM

The proposed system is Cloud based Multilingual Web Translator Engine for Banking services (CMWTEB). Creating bank Website in more than one language facilitate access to information at locales and for global users. This system is designed in such a way that it will be implemented and used easily. The proposed system is designed in a elegant manner so that the user can easily interact with the system even if the user is unaware of the system. The creation of global websites for locale and maintaining the websites are easy and simple by this proposed system as it offers cloud based solution for website localization [11]. This proposed system intends to take advantage of cloud computing, to cluster sparse multilingual engines and form a user or customer friendly front-tier, thereby demonstrating Multilingual Computing as a Service. The proposed system provides a Multilingual Translation Engine on Cloud, like a plug-in, to parse and translate web pages according to the users' preferred language for the Banking Industry as a feature of Customer Delight. The Functional Architecture of proposed system, Cloud based Multilingual Web Translator Engine for Bank, is presented as business model of cloud computing in figure 1.

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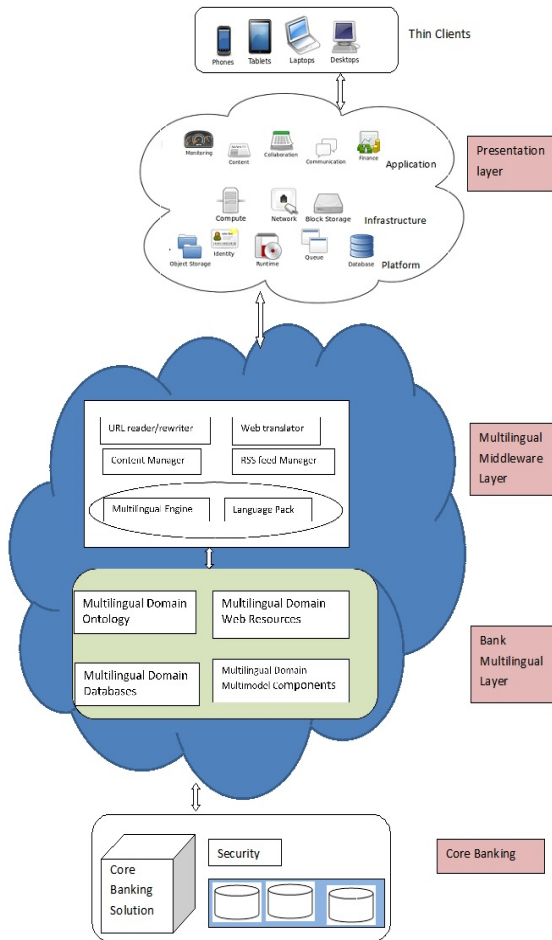**NCETCS - 2016 Conference Proceedings**

Fig. 1. Functional Architecture Of Cloud based Multilingual Web Translator Engine for Bank

There are four layers in the proposed system. They are presentation layer, multilingual middleware layer, Bank multilingual layer and core banking. Presentation layer is responsible for accepting and presenting the reply of the user request using cloud features. Multilingual middleware layer has URL reader/rewriter, web translator, content manager and RSS feed manager as components to interface with multilingual engine and to translate for website. Bank multilingual layer components multilingual domain ontology, multilingual domain web resources, multilingual domain databases and multilingual domain multimodel components are to support the multilingual middleware layers to provide multilingual website. The Core Banking helps by providing the information for the user from its database in secured manner.

The thin customer service request is passed through the cloud at presentation layer. Next to the presentation layer, website related service is carried out by multilingual middleware layer components and then followed by components of bank multilingual layer. The requested service get the relevant details from core banking and made available in multilingual with the help of cloud based multilingual middleware layer and bank multilingual layer. Finally the response to the client requested service is provided using the cloud at presentation layer.

TABLE I

Comparison of Multilingual Software Qualities between select systems and our proposed system

Multilingual software Qualities	Bhoomi	aAQUA	Vidyanidhi	Cloud based proposed System
Modifiability	No facility to add new language	No facility to add new language	No facility to add new language	Number of language is not a contraints
Understandability	Limited at design level	Limited at design level	Limited at design level	Option to improve
Reusability	Integrated to other software	Developed for particular domain	For any documents maintenance	Integrated to other software
Adaptability	Domain but not in language level	Domain but not in language level	Documents only	Both in domain and linguistic level
Language Neutrality	Developed to a particular language	Developed with audio assistance in local language	Support in search	to any language

The proposed system for bank makes convenient to bank officials to deal the request in any language they wish and to reply the customer convenient language. It allows easy improving the consistency of language with lesser cost and for quick response to clients. The multilingual qualities of the proposed system are presented in table I. It can be inferred from the above table the proposed system has better multilingual software qualities with more sophisticated multilingual services.

IV. SUMMARY

The proposed system, Cloud based Multilingual Web Translator Engine for Banking services, support all features of multilingual software. CMWTEB allows reusing the some of the components with minimum change for inclusion of new language. This system is adaptable to any language the user interested to work. The investment cost of this system is reduced due to cloud features. CMWTEB is user understandability, as it has interface to core banking and cloud based multilingual services. It is modifiable to add new services.

The important of multilingual features in global market is presented. The internet made easy for the software developers to reach global markets. The website created in country like India must be in multilingual. This is illustrated with Bhoomi, aAQUA and Vidyanidhi. These multilingual website provide service to common man in locales. The proposed system, CMWTEB, is designed to the country like India having multilingual speaking people.

REFERENCES

[1]   http://unicode.org/
[2]   http://landrecords.karnataka.gov.in/bhoomiweb/
[3]   https://aaqua.persistent.co.in/qua/forum/index
[4]   http://www.dil.iitb.ac.in/docs/aAQUA pdf
[5]   http://eprints.uni-mysore.ac.in/
[6]   www.ildc.gov.in

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[7] Chappell, David. The three aspects of software quality: Functional, structural, and process. Technical report, Microsoft Corporation.

[8] V. Prasanna Venkatesan and S.Kuppuswami, ARMMS - Architecture Reference Model for Multilingual Software, Journal of Convergence Information Technology Vol. 3 No. 2, June 2008.

[9] Tsai, Wei-Tek, Xin Sun, and Janaka Balasooriya. "Service-oriented cloud computing architecture." *Information*

Technology: New Generations (ITNG), 2010 Seventh International Conference on. IEEE, 2010.

[10] Hashmi, Sajid Ibrahim, et al. "Using the cloud to facilitate global software development challenges." Global Software Engineering Workshop (ICGSEW), 2011 Sixth IEEE International Conference on. IEEE, 2011.

[11] Zhang, Qi, Lu Cheng, and Raouf Boutaba. "Cloud computing: state- of-the-art and research challenges." *Journal of internet services and applications* 1.1 (2010): 7-18.