GLOBALIZING OF TECHNOLOGY MODULE IN CONTEXTUALIZED LANGUAGE INSTRUCTION

A Thesis
Presented to the
Faculty of
San Diego State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Computer Science

by
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Fall 2011
SAN DIEGO STATE UNIVERSITY

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DEDICATION

I would also like to dedicate this project to my family and friends for their unconditional love, support and guidance, which helped, instill in me the confidence and zeal I have today.
If you talk to a man in a language he understands, that goes to his head. If you talk to him in his own language, that goes to his heart.

Nelson Mandela
ABSTRACT OF THE THESIS

Globalizing of Technology Module in Contextualized Language Instruction
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San Diego State University, 2011

The module "Technology in Contextualized Language Instruction" provides models and insights into the ways in which teachers can use technology to connect their students and guidance as to the ways in which teachers can use technology to connect students with target language communities, while addressing the national technology standards established by the International Society on Technology Education.

The purpose of this research project would be to develop an interface for teachers from remote areas to interpret this module with ease in their respective language. The project intends to target five different languages and present technology in a better way to those who are not well versed with advanced computerized teaching techniques.
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ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to all the people who have supported and encouraged me in completing this thesis project.

First, I would like to thank my project advisor, Dr. Mary Ann Lyman-Hager, and Professor Minjuan Wang for giving me the opportunity to work on this thesis project. I am grateful for their continuous guidance, support, and motivation throughout the project.

A special thanks to my Committee Chair, Dr. Carl Eckberg, for accepting me as his thesis student. He has been very kind and patient whenever I needed his supervision.

I am grateful to Dr. Joseph Lewis for being on my committee and for his help and co-operation.

Finally, I would like to thank all my friends for all the encouragement and motivation.
CHAPTER 1

INTRODUCTION

Globalization is the process by which societies; cultures and economies have become integrated through a global network of ideas. [1] Amongst the various factors responsible for its growth is the worldwide spread of technology. Technology has redefined the way we do business, be it any sector or industry.

Over the past decade, the pace at which technology has become integrated with the traditional forms of teaching methodologies is noteworthy. Not only has it aided by integrating language instruction but it has also changed the teaching practice. There has also been a paradigm shift in the approach of the instructors and the students towards technology. In this paradigm there are three major stakeholders involved: the instructors, the students and the technical staff. [2]

In case of foreign language teaching and learning (FLTL), use of computers is made extensively nowadays so that the students get to experience the target language or culture. Computer tools might well be useful for the students to learn a foreign language but the possibility that these tools might replace or substitute the need for a human interaction altogether is meager. There are some activities that support this point; activities that involve face to face interactions, conducting role plays, having group discussions and sharing different opinions which add to the learning amongst the students and for which a computer aided tool cannot serve as substitute. Learning to converse in foreign language requires learning to interpret the meaning by observing the speaker’s body language and other social behaviors’. [3]

Researchers are doubtful about the possibility of computer-aided tools replacing humans in this aspect. These tools can well be helpful in to practice receptive skills, raising awareness about language and reinforcing the acquisition of language forms. [4]

Computer-assisted language learning (CALL) is defined by Levy (1997) [4] as "the search for and study of applications of the computer in language teaching and learning". [4] CALL provides a wide range of applications and approaches to teaching and learning foreign
languages from the traditional programs to the more recent manifestations as in a virtual learning environment and web based distance learning. Computer assisted language instruction (CALI) was used before CALL but it was fell into disfavor by language teachers as it implied to adopt a teacher – centric approach whereas language teachers preferred a student – centric approach as it focused more on learning rather than instructions. [1]

CALL is a tool that helps teachers to ease the progress of the language learning process. It can be used to reemphasize on what has already been learned in the classroom or as a remedial tool to help the users who require additional support. It helps the learners work on their own by laying a strong emphasis on student – centric materials.

The traditional computer assisted language learning (CALL) tools provide feedbacks on a very limited basis such as multiple choices, matching or filling out a form. There is a brilliant prospect for developing CALL tools that provide personalized feedbacks on the errors committed by learners and which would help cultivate linguistic awareness of pertinent language forms. There is an obvious need for linguistic modeling to better the ability of CALL systems to handle more complex exercises and to provide detailed individual feedback. [3]

The question of the impact of CALL in language learning and teaching has been raised at regular intervals ever since computers first appeared in educational institutions. A distinction needs to be made between the impact and the effectiveness of CALL. Impact may be measured quantitatively and qualitatively in terms of the uptake and use of Information and Communication Technology (ICT) in teaching foreign languages, issues of availability of hardware and software, budgetary considerations, Internet access, teachers’ and learners' attitudes to the use of CALL, changes in the ways in which languages are learned and taught, and paradigm shifts in teachers’ and learners’ roles. Effectiveness, on the other hand, usually focuses on assessing to what extent ICT is a more effective way of teaching foreign languages compared to using traditional methods – and this is more problematic as so many variables come into play. Worldwide, the picture of the impact of CALL is extremely varied. Most developed nations work comfortably with the new technologies, but developing nations are often beset with problems of costs and broadband connectivity. [1] Evidence on the effectiveness of CALL, as with the impact of CALL, is extremely varied and many research questions still need to be addressed and answered.
A crucial issue is the extent to which the computer is perceived as taking over the teacher’s role. Computer is playing an “intelligent” role, and a computer program should ideally be able to understand a user’s spoken input and evaluate it not just for correctness but also or appropriateness. It should be able to diagnose a student’s problems with pronunciation, syntax, or usage and then intelligently decide among a range of options (e.g. repeating, paraphrasing, slowing down, correcting, or directing the student to background explanations). Since the advent of the Web there has been an explosion in online learning, but to what extent it is effective is open to criticism.

As for the effectiveness of CALL in promoting the four skills, there are enough data in CALL to suggest positive effects on spelling, reading and writing, but more research is needed in order to determine its effectiveness in other areas, especially speaking online. Students’ perceptions of CALL are positive, but the technologies need to be stable and well supported, in order not to interfere with the learning process. Training in computer literacy for both students and teachers is essential, and time constraints may pose additional problems.

Technology continues and in the future would continue to dominate as an essential tool in day to day communications. However the instructors and the other adopters would continue to display some resistance towards the use of these new tools at the initial phases of its life cycle. The adoption of technology in to the educational and learning practices is a sluggish and conservatively occurring phenomenon. It is often characterized as tentative process, one that requires the instructor to take the risk of conducting a new teaching technique and ventures to seek out conference around university grounds. [1]

1.1 CONTRIBUTION

My task was to add an interface to a website where teachers can add topics (with data) to the website and select languages that are available from Google translator, so that the topic added can be rendered in different languages. Also if the teacher wants, the part or entire topics translation from Google can be replaced or edited with the teacher’s translation in his or her own language.
1.2 Overview of the Thesis

The report is organized as follows.

- Chapter 2: This chapter comprises of the literature review. It would provide references to the history of the thesis issue.
- Chapter 3: The technologies used to develop the system and the reasons for using them are described in this chapter.
- Chapter 4: System Design. System architecture and design are discussed in this chapter.
- Chapter 5: Implementation details of this system. Also the common attacks and prevention techniques implemented during development of the system will be explained in chapter 5.
- Chapter 6: User Interface and Appearance. This chapter provides a brief description of the User Interface.
- Chapter 7: Conclusion, which includes summary of findings and suggestions for improvement for this system.
CHAPTER 2

LITERATURE REVIEW

Just a decade ago the use of technology and its integration into the daily curriculum was not as high a priority as it is today. [2] The same instructors, who were cynical about the adoption of the technology then are, today adept in using it and want to increasingly control it. The instructors who adopted the technology in the beginning phases helped create a ripple effect, which in turn facilitated its spread amongst others. More and more number of facilitators who wanted to give their students comprehensive study material started switching from the traditional forms of teaching to the technology integrated forms. Some used the technology in their own way to create academic content and are also open to try related technologies. Even where nothing else has changed there is a notable change in instructors’ attitudes towards technology. They now view processes such as extracting streaming files as simple and convenient. This change in perception can be attributed to the framework established by the instructors in which the systematic plugging of online streaming files into the core curriculum was possible just as one might insert a paragraph from classical transcripts into the textbooks. [2]

2.1 COMPUTER ASSISTED LANGUAGE INSTRUCTION

Many studies were conducted between 1960s and 1980s to demonstrate the effectiveness of CALI (Computer Assisted Language Instruction) over the traditional forms of learning foreign languages [5]. Comparative studies like CALI versus language lab instruction or traditional classroom learning and assignments done by making use of computers versus task completion by paper and pencil have failed to demonstrate any significant differences in the learning. Other study says that if the use of CALI is not just limited to transferring printed textbooks to computer screens and appropriate features are incorporated in it significant differences in learning can be observed. One of the most promising features of CALI is its ability to provide the learner with a detailed and quick feedback in response to the student errors. [4]
With reference to the CALICO Journal [6], the learning of foreign languages can be accelerated with computers considered as a potential tool. This journal features studies which demonstrates the effectiveness of CALI (Computer Assisted Language Instruction) as compared to non-CALI instruction based on a study which comprises application of natural language processing technology to second language instruction. Tests were taken with group of students developing learners’ grammatical skill in producing Japanese particles and sentences provided with same grammar notes and exercises, performing same language learning with CALI and non-CALI instructions. Results accentuate the importance of intelligent feedback while language learning.

The workbook instruction (Non-CALI) is simply accompanied by answer sheets without any explanations on the individual errors. The traditional CALI indicates only missing or unexpected particles which simply is nothing more than an electronic page-turner which cannot expect better results from CALI, as commented Kleinmann (1987) [7]. Thus there was no significant difference between the results from traditional CALI and Workbook instruction group performance. As suggested by Pederson (1987) [8] and Dunkel (1991) [9], the study also asserts that the use of a medium, which is computer in this case, alone does not bring better effects; rather the quality of the messages produced by the medium affects the result.

**2.2 INTELLIGENT NIHONGO-CALI**

The second type of CALI is intelligent Nihongo-CALI, which also indicates the positions of missing particles, but no detailed grammatical explanations on the errors were provided. The results reveal that intelligent feedback is significantly more effective than both types of traditional feedback. It indicates that the relative effectiveness of CALI and non-CALI (i.e., workbook instruction) varies depending on whether CALI is accompanied by intelligent feedback or traditional feedback, which brings out the importance of providing an intelligent level of feedback to the learner, a task for which natural language processing is well suited. Also the significant difference was observed in Nihongo – CALI and workbook test was in production tests rather than comprehensive tests.

Though the study elaborates over the positive side of effectiveness of CALI over workbook instruction but it is not always the case that CALI would be more effective than
workbook instruction. It highly depends on the group complexity of the target structures, the kinds of tasks assigned to the students, and the learner's knowledge level.

Researchers feel that the integration of the expertise gained by the instructors in foreign language teaching into the development of integrated computer assisted language learning (ICALL) systems is the major challenge in the research and development of ICALL. However there have been few exceptions which showcase the successful integration of natural language processing (NLP) technology in ICALL systems. *Robo Sensei, Spanish for Business Professionals & E-Tutor* are few such examples. [3]

### 2.3 Robo Sensei System

In *Robo Sensei* system for Japanese the activities are finely contextualized providing visual aids for each lesson and with Japanese drawings. *Spanish for Business Professionals* is a program for teaching Spanish in which one finds several tools that provide links to grammar explanations, words are linked with electronic bilingual dictionary and also various other audio and visual aids are available. The *E-Tutor* is an ICALL system that provides a web interface and has been evolved over the years. It is mandatory for the students admitted to the German class to complete E-Tutor exercises as a part of their curriculum. [3]

### 2.4 Challenges in Developing ICALL Systems

*Constraining the learner input to the system:* It is necessary so that the input provided by the students can be processed effectively and efficiently. Effective and efficient processing of the input will lead to better and reliable feedback messages with higher precision. Also it is necessary for an ICALL system to provide no analysis for some cases where the meaning cannot be correctly interpreted in another language rather than providing with some erroneous and incorrect feedback. Another difficulty faced by the current ICALL systems is in the interpretation of the meaning in cases where same word has for two different meanings and where the meaning of such words mostly depends on the context and form of the statement.

*Activity specification and instructions:* The activity design in the development of ICALL systems plays a vital role in constraining the student input. Such activities should be presented to the learner in a way that is more specific and with complete instructions in order
to guarantee that the expectable variation in the learner input remains within the reach of what can be easily processed.

*Feedback based on linguistic, learner & activity information:* ICALL systems have ability to analyze the inputs provided by the learner and present appropriate feedback. While the human tutors take into account the information about the learner (age, level, maturity, etc.), the task (reading, listening, writing, etc.) and the language; the ICALL systems only rely on the language aspect for providing the feedback. Hence the linguistic analysis that the learner receives is based merely on the grammatical terminology whereas the tasks, the activities, the context and the individual learner differences are not taken into consideration [10].

### 2.5 Approaching the Challenges

The systems that are approaching the challenges discussed are briefly discussed below.

#### 2.5.1 TAGARELA

A teaching aid for grammatical awareness, recognition and enhancement of linguistic abilities (TAGARELA) is an ICALL system used for teaching Portuguese at the introduction level. It helps in practicing listening, reading and writing skills. It also provides the user with personalized feedback on spelling and grammatical mistakes. TAGARELA was introduced at Ohio State University after which a number of universities have started utilizing it.

There are six different types of activities that can be performed in TAGARELA; reading comprehension, listening comprehension, picture description, rephrasing, fill in the blanks and vocabulary. The system provides immediate feedback to the learner for all the aforesaid activity types. To increase the acceptability of TAGARELA, all such mechanisms that constrain the input from the learners in a way that eliminates meaningful interaction have been avoided. Hence translation and dictation exercises or any such activities that could restrain the inputs from the users and could pose any kind of problem have been avoided in TAGARELA.

Figure 2.1 [3] shows the Listening comprehension exercise for TAGARELA. In TAGARELA each activity page has a common general page format. On the top of the page is

the system banner and the menu tabs. Below it there is the name of the activity and option to select other activities. In the central part of the page is the activity being executed and the instructions for it. The user can enter the text at the bottom left of the page and the respective feedback is obtained at the bottom right. Also each activity uses a specific icon and page color to identify the activity and to provide consistent visual cues to the user.
### 2.5.2 System Architecture

The TAGARELA architecture consists of six different modules viz., Interface, Analysis Manager, Feedback Manager, Expert Module, Instruction Model, and Student Model as shown in Figure 2.2 [3].

![TAGARELA Architecture Diagram](image)

**Figure 2.2.** TAGARELA architecture. Source: L. Amaral and D. Meurers. On using intelligent computer-assisted language learning in real-life foreign language teaching and learning. *ReCALL*, 23, no. 1: 4-24, 2011.

The above-mentioned architecture was created taking into consideration the types of activities that the TAGARELA system proposes. The TAGARELA architecture is freely available to the researchers under a specific license [11, 12].

### 2.6 ITS (Intelligent Tutoring System)

ITS is any computer program/system that provides direct customized instructional feedback to students to enhance learning. [13-15] It has existed since the 70s but has picked up in U.S. since the past two decades. ITS systems are classified more as expert systems and
artificial intelligence systems which stimulate aspects of human tutoring and promote self-learning by doing rather than repetition and drill and practice. Intelligent tutoring systems consist of four different modules: the interface module, the expert module, the student module, and the tutor module. The interface module provides the resources for the students to interact with the ITS, normally via a graphical user interface and sometimes through a rich simulation of the task domain the student is learning. The expert module references an expert or domain model containing a detailed description of the knowledge of Behaviors that represent expertise in the subject-matter domain the ITS is teaching -- often an expert system or cognitive model. The student module uses a student model containing descriptions of student knowledge or behaviors, including his misconceptions and knowledge gaps. A mismatch between a student's behavior or knowledge and the expert's presumed behavior or knowledge is signaled to the tutor module, which subsequently takes corrective action, such as providing feedback or remedial instruction. To be able to do this, it needs information about what a human tutor in such situations would do: the tutor model. Success of an intelligent tutoring system depends on how good the various models it is based on are [16]. It relies on various models to adequately model expert, student and tutor knowledge and behavior. Thus, building an ITS needs careful preparation in terms of describing the knowledge and possible behaviors of experts, students and tutors. This description needs to be done in a formal language in order that the ITS may process the information and draw inferences in order to generate feedback or instruction. Therefore a mere description is not enough; the knowledge contained in the models should be organized and linked to an inference engine. It is through the latter's interaction with the descriptive data that tutorial feedback is generated. ITS is the next level of CALL. It uses interface and artificial intelligence to stimulate learning. Examples are games where the learner is put in a war zone and has to learn the language, its pronunciation, nuances, etc., before he moves to the next level. [13, 14]

### 2.7 CMC (COMPUTER MEDIATED COMMUNICATION)

CMC software enables users to use lengthy conversation pieces for communicating rather than short bursts of messages [17]. They have been in existence in a primitive form since the late 60s, but their use has become highly prevalent in the past few years. CMC
software and programs allow students, teachers, and others to communicate directly with each other, in a convenient and inexpensive manner. It also allows students to communicate with other students, teachers and random people who are fluent in the language they want to learn. CMC involves use of multimedia, WWW, e-mail, live chatting, blogging, and social media, video, pictures, audio conferencing, video conferencing, etc., for promoting and enhancing learning. CMC involves the U.S. of the Internet, website, and is also moving into mobile learning where teachers and students have access to learning material and data over mobile platforms, such as a cell phone, PDA, e-readers etc. [18].
CHAPTER 3

TECHNOLOGIES

This chapter focuses on the technology used to develop the software for the described thesis idea and briefly discusses the supporting software and alternatives over which the given technology is used.

3.1 DYNAMIC CONTENT DELIVERY TECHNOLOGIES

Technologies associated with dynamic content delivery can be classified into server-side and client-side:

- **Client Side**
  Client side technology allows interactive elements to be run on the user's web browser. Where the browser interprets and executes the received application. This allows for site navigation using rollover menus and such things as client side validation, which also places a heavy processing load on the client-side device.

- **Server Side**
  Server side technology, commonly used in e-commerce applications and back-end databases, provides interactive websites that allow a user to interface databases and retrieve or modify data residing on a web server. The browser is only given the resulting HTML/WML page generated on the server. This minimizes network traffic between the browser and the server and makes server-side technologies more suitable for thin clients.

Technologies used in this thesis are PHP, Smarty templating system and MySQL administration tool.

3.2 PHP

PHP stands for Hyper Text Pre-Processor, originally known as Personnel Home page. It is a general purpose scripting language that was originally designed for web development to produce dynamic web pages.

PHP was originally written by Rasmus Lerdorf in 1994 and was created to display his resume. In 1997 the Zeev Suraski and Andi Gutmans during their studies on the Israel Institute of Technology continued with Lerdorf's work, rewriting a new base called PHP 3 introducing basic object-oriented programming functionality. Later in 1999 Suraski and
Gutmans completely rewrote the core of PHP, which produced a new script engine called the Zend Engine. This new script engine lay ground for further releases of PHP up until version PHP 5 which was powered by Zend Engine 2. The latest stable release for now is PHP 5.3.5 released in Jan 6 2011. All the PHP code resides the server.

Figure 3.1 [17] shows the working of PHP engine. When the browser requests an ordinary HTML page, the server just sends the file to browser. But this process is different for PHP page. When a browser requests a page written in PHP, the server executes the PHP code and produces a new HTML page which is sent to the requesting browser. So in this process the php code is never revealed [19].

![PHP engine diagram](image)

**Figure 3.1. PHP engine. Source: Peter Henriksson, Designing content distribution with trading options - "Yank Yank": a prototype system, 1st ed, GOTEBORG, Sweden, December 2009.**

### 3.2.1 Motivations for Selecting PHP

In developing this software PHP was selected as the scripting language. The motivations are as follows:

- **High performance:**
  
  PHP can achieve the highest performance by using PHP caches, such as Zend [18] and APC [18]. PHP caches pre-compile PHP scripts into native CPU code and store them in cache memory.
Accelerated database connectivity:
Database connectivity usually slows down the performance. In PHP, however, connections remain open after a page is finished being processed; thus, dramatically improving the performance. PHP supports a vast number of free and commercial databases as well as the ubiquitous Open Database Connectivity (ODBC).

Rich set of functions for building images on-the-fly:
PHP can deliver dynamically both vector (Flash, SVG) and raster formats (e.g. PNG, JPEG, GIF, and WBMP). This makes PHP a preferable technology for delivering dynamic graphics on mobile devices.

Separating the web design from logic programming:
For large-scale business applications it may be necessary to separate the web design from logic programming. PHP supports template driven designs through such template engines as Smarty [6]. Smarty reads the template files and creates PHP scripts only once, avoiding the need to parse the template files repeatedly.

Open-source software:
Being open-source software PHP also provides the cheapest option. The only cost for PHP might be for the Zend Cache. However, our experience thus far suggests that use of the free APC cache provide satisfying level of performance.

Extensibility:
PHP is highly extensible and supports Java, XML, COM/DCOM, LDAP, IMAP.

3.2.2 Alternatives Available for PHP

For developing web applications and work with WWW, there are many options available. The Market had many considerable projects that have developed their own programming language or worked over existing language for this purpose.

These options can very well be classified in two broad categories.

1. Scripted Languages
2. Complied Languages.

Following discussion directs to the advantages, use and feasibility of given languages.

Java: Java can be used in web application in either form of Java servlets or JSP. Java servlets are java programs that present and implement an interface. Java programs have to be compiled and deployed to a webserver. PHP wins in simplifying thing over Java as PHP programmers can configure the web servers for PHP and MySQL. Whereas the Java programmer may find it difficult to configure and deploy server like Web sphere or Web logic, in that case tomcat with apache may be simple.

ASP.NET: ASP stands for Active Server Pages, and .NET, according to Microsoft, a set of Microsoft software technologies for connecting information, people, systems, and devices. ASP.NET is not a language but a solution that is provided by Microsoft.
If users want to use the supported languages, an API is provided with common functionality for web use. In ASP.NET only code that can be compiled to intermediate language can be executed. The biggest drawback of ASP is that it’s a proprietary system that is natively used only on the Microsoft Internet Information Server (IIS) platform. This limits availability to Win32 based servers.

The reason to choose PHP over ASP.NET is PHP is relatively simple language to use, better support for the database management system, MySQL and also good support for object-oriented system.

**Perl:** The advantage of PHP over Perl is that PHP was designed for scripting for the web, while Perl was designed to do a lot more. Because of this, Perl can get very complicated.

The flexibility / complexity of Perl can make it difficult for developers of varying skill levels to collaborate. PHP has a less-confusing and stricter format without losing flexibility. PHP is also easier to integrate into existing HTML than Perl. In large part, PHP has all the ‘good’ functionality of Perl - constructs, syntax, et cetera - without making it as complicated as Perl can be. Yet PHP’s command-line interpreter (CLI) is powerful enough to perform high-level tasks much in the same way Perl has been traditionally employed. Perl is a very tried and true language, and has stood its ground since the 1980’s, but PHP has matured and evolved quickly, and continues to make fantastic progress. [13]

### 3.3 Smarty

Smarty template system is one of the tools used in the development of this thesis. It is a web template system written in PHP, created by Monte Ohrt and Andrei Zmievski in 2001. The objective of this templating system is to separate business logic from presentation logic. In this case the business logic is the PHP and the presentation part consists of the HTML code. Smarty is intended to simplify compartmentalization, which eases the costs and efforts with software maintenance.

Figure 3.2 [20] shows the MVC (Model-View-Controller) design pattern used in designing of web applications.

In Smarty, the compartmentalization components can be described in Model-View-Controller design pattern as follows:

**Model:** This part of pattern handles the behavior and data of the application domain. In this case, it handles the business logic. The PHP scripts written by the programmer plays this part.

View: this part usually is the user interface where it provided a part, which is suitable for interaction. For this part of pattern, Smarty is used as a View component, which is responsible for handling the output, and it’s formatting.

Controller: the processing of the input is done by the controller part. It accepts the user input and instructs the model and view to perform suitable actions depending on the input received, in this case PHP [21].

As Smarty provides the presentation logic to concerned designers of application, these designers can change the content of templates, which are given as directives, as variables, functions, logic or control flow statements. In smarty, all directives are enclosed by square brackets, variables are denoted as supplementing the $ character as pre_x. the Template in smarty is compiled into php code only once, that is avoiding run time parsing which gives a high performance [22].

Following are the alternative to Smarty: projects that provide templating PHP are available and the idea is quite common

Pat Template: This project highly relies on XML notation. Stephan Schmidt created it. The Templates defined tag and variables were inserted as XML tags.
**PHPLIB:** This is an object-oriented application development toolkit for PHP. It is primarily of benefit to Web application developers, but contains classes which are useful to other PHP developers as well. SourceForge.net registered it

**HTML_template:** It is a substantial part of PEAR repository, developed by Ulf Wendel. Contrary to smarty no programming logic is provided. The reason the select smarty is because of its feature and its steady improvement.

### 3.4 MySQL

MySQL is a relational database management system. It is named after developer Michael Widenius’ daughter, My. The SQL phrase stands for Structured Query Language. MySQL is a popular open source database because of its high performance, high reliability and ease of use. MySQL is owned by the Swedish company MySQL AB, they also holds the copyright to most of the code base.

MySQL is freely available and can be downloaded from their homepage www.mysql.com. This Database has support for several storage-engines such as MyISAM, which is default storage, and InnoDB, which have support for transactions and foreign keys. MySQL runs on more than 20 platforms including Linux, Windows, Mac OS, Solaris, HP-UX, IBM AIX, giving you the kind of flexibility that puts you in control.

### 3.4.1 Alternatives for MySQL

There are some alternatives to MySQL that provide additional features, which may make them more favorable for certain uses.

- **PostgreSQL** is often described as open source version of Oracle. PostgreSQL is a powerful, open source object-relational database system. Indeed it provides a similar set of SQL commands but lacks PL/SQL. This DBMS should be used when DBMS speed is not a crucial point.

- **Oracle** is a well-known, fast and commercial RDBMS. Oracle is only limited to large corporations due to licensing costs and not all hosting companies have Oracle (they might have SQL Server, but not Oracle). Oracle would be better option in case of lots of data usage and storage. Due to its performance and scalability it has a wide distribution. With the integrated programming language PL/SQL many problems can be solved at database level resulting in a fast alternative to their solution at the top level programming language.

In the latest versions of PHP **SQLite** is featured as an alternative for MySQL. SQLite is an Open Source library that implements a self-contained transactional SQL database engine which requires no server and works on little or no configuration. When integrated with PHP, database files are written directly – it does not act as wrapper for
an external engine. MySQL on the other hand is also an Open Source Relational Database Management System.

3.4.2 SQL Administration Tool

PhpMyAdmin is a free web administration tool used to administrate MySQL databases through Internet. It is written in PHP and is developed by the phpMyAdmin Project which took over the development from Tobias Ratschiller in 2001 due to the lack of time.

3.5 JavaScript

JavaScript is an object based scripting language. JavaScript is totally different from Java and is developed by Netscape. It derives its functionality from built in objects. With JavaScript you can create your own objects. Widely used by web developers to perform the form validation.

Because JavaScript programs are designed to run within HTML documents, they are not tied to any specific hardware platform or operating system. However, JavaScript programs are tied to a specific user agent. Generally, these user agents are browsers.

There are no absolute trends about the use of JavaScript. Some users have scripting turned off. Some browsers don't support scripting. Following Table 3.1 shows the statistics for javascript based websites for enlisted years [23].

Table 3.1. Statistics for Javascript Based Websites for Enlisted Years

<table>
<thead>
<tr>
<th>Date</th>
<th>JavaScript On</th>
<th>JavaScript Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2008</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>January 2007</td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>January 2006</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>January 2005</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>January 2004</td>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td>January 2003</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>January 2002</td>
<td>88%</td>
<td>12%</td>
</tr>
<tr>
<td>January 2001</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>January 2000</td>
<td>80%</td>
<td>20%</td>
</tr>
</tbody>
</table>

CHAPTER 4

SYSTEM DESIGN

This chapter discusses the system components and design modules with various entities in and responsibilities that each component of system holds. This chapter also discusses the Interaction between different roles of the system.

Following is the brief description of system requirements.

4.1 **USER (STUDENT) REQUIREMENT**

Below are the student requirements, which were considered to design the tool.

- User must be able to login and register into the system
- The user must be able to see the lesson Topic List by uploaded.
- User must be able to see the translation selected for the languages selected by teacher.
- User must be able to comment on the topics and teacher who created the topics should moderate this comment.
- Student must be able to update his or her profile.

4.2 **USER (TEACHER) REQUIREMENT**

Similarly for teachers, below are the requirements, which were considered to design the tool.

- Teacher must be able to add a topic to existing topic list.
- Teacher must be able to upload multimedia content to the topic posted. The multimedia content could be audio, video or images.
- Also, the Teacher must be able to select the languages in which the topic translations will be available for the students.
- Teacher must be able to edit the translation obtained from Google translator.
- Teacher must also be able to add comments and moderate the comments on his respective topic.
- Teacher must be able to update his or her profile.
4.3 Admin Requirement

Admin is the super authority. It is authorized to do the following:

- Admin moderate and delete topic from the topic list.
- Admin can delete a user teacher and can also approve a user as a teacher and provide the desired privileges.

Figure 4.1 describes the use case diagram for the system. This diagram provides the graphical representation of all the entities (actors) and their roles and responsibilities. The interaction of these entities, the privileges they share and the dependencies between these entities is elaborated in the diagram.

4.4 System Modules

This section discusses the various modules and detailed functional description of each one of them.

4.4.1 Registration and Login Module

- User can register as student or teacher. If user is teacher, then he needs super admin approval.
- Password is hashed with asymmetric algorithm and stored in database.
- After registration, mail will be send about login details.
- Forgot password option will ask for email-id. Then newly generated password will be mailed to concerned user. System will ask to change password to user until he resets his first time login password.

4.4.2 Interface

- Teachers can Add Topics to website.
- Documents can be uploaded to support a topic (Format: presentation, video, audio, images)
- Preview option of how the translation appears by Google translator.
- Option to add translation for any language from the teacher. And this translation should be saved in database.
- The administrative rights of the topic added would remain with teacher who created the topic.
- Teacher should be able to edit the topic he created after it is added to topic list.
Figure 4.1. Roles and responsibilities.
4.4.3 Social Connectivity

- Connecting this project with LARC so that Recent updates from LARC can be seen on this website.
- Also social networking sites like twitter, face book should be connected so that users will have the ability to follow LARC through this system

4.5 Application Architecture

This translation tool is based on three-tier architecture, as shown in Figure 4.2. This architecture, which is the fundamental framework for the logical design model, segments an application’s components into three tiers of services. Because of the flexibility of maintaining the system and adding upgrades becomes lot easier because of this architecture, which makes this suitable for almost all online systems.

![Figure 4.2. Traditional three-tier architecture.](image)

4.5.1 Presentation Tier

The topmost layer presents data to the user and optionally permits data manipulation and data entry. The user interface, which runs on the client side provide the medium for clients to communicate with the system. This layer presents all the information that the user requests.

The client tier consists of communication between users and the system. For this project, users can be faculty and the students accessing the system on their web browsers.
This tier consists of the presentation of the system and thus provides a user interface to the system. This thesis consists of a web-based system therefore the presentation tier consists of web browsers, such as Internet Explorer or Mozilla Firefox. With the help of this tier, only users can communicate with other tiers. Generally, in web-based applications, this tier consists of HTML, CSS and JavaScript.

4.5.2 Application Tier

This tier contains the business logic of the system. It is a linking tier between other two layers. It consists of functional modules that actually process data. It contains the web-server where the system code is executed. This tier logically decides if the user request should be forwarded to database or should be handled through the presentation layer itself by sending back the request to use. This simply can be explained as, the interaction between the user and this layer does database.

This layer consists of the web server, web scripting languages (PHP in our system) and scripting language engine. The web server processes the HTTP requests and formats the response to the specific request accordingly. The scripting engine is involved in the processing of request and calculation of the response. This allows for serving dynamic content and has built in libraries enhances the access by reducing access time to database tier.

4.5.3 Data Tier

The database layer consists of the Database Management System or the DBMS and the database itself. This database management layer manages the storage, retrieval of data as well as allows simultaneous access, provides security, data integrity and support applications.

The database server lies in this tier. MySQL 5.0.51 has been used as the database server. Functions like insertion, retrieval, updating and modifying, etc. take place in this tier regardless of the Application Tier. The Application Tier is involved with the data request process and routing the request to the database tier.
CHAPTER 5

DESIGN AND DEVELOPMENT

Considering the Literature review of online teaching systems and e-learning factors following components and functionality has been identified as needed according to the requirements specified in earlier chapters.

The functionality mainly demands the workflow of online training from modules and user-friendly interface as the teachers and students may belong from different regions. Specifically the User should be able to create an account in this system and be able to easily manage the flow of editing the existing content and comment on the content of the system the published content should be available to all the users (students and teachers in the system).

5.1 METHOD

Building this system from scratch needs a very good understanding of what you need to do to abstract the project into lower levels and identify the components on each level. Therefore a top-down approach is used in structuring of the project. As discussed earlier in chapter 4, this system has three-tier model architecture.

To keep the logic and presentation part separated, smarty templating system was used. Due to this PHP was selected as server side scripting language and smarty was selected as the templating engine. To keep Html code clean CSS was selected to manage the design and styling of web pages. MySQL was chosen to be data tier since it has a well-documented API towards PHP.

5.2 DATABASE DESIGN

The system data is stored in database. This database structure consists of eight tables. The table’s admin, documents, events and news are independent of each other. Thus the data is added to these tables without affecting any other table.

The tables topics, topic_description and topic_comments has a foreign key constraints meaning that the tables has primary keys related to another table.
This is very useful in the case when an entry and all the data related to the entry is to be updated or deleted. The relationship between tables can be visualized from Figure 5.1.

The brief description of each table is as follows:

- **admin**: stores Login details for system administration.
- **users**: stores the login data and details related to user for maintaining user profile.
- **events and news**: the events and news details for LARC from website.
• *topics*: includes the topic_id added to the system by teachers. and details of teacher who added the topic.

• *topic_description*: It includes topic id, title, description, and language-id for the languages selected by teacher

• *topic_comments*: includes id and details about every comment added on the topic.

5.3 **SYSTEM STRUCTURE**

According to the system requirement entire system logic can be broken down to four modules.

First module represents the presentation section, which is a web- interface that provides administrator means to interact with the system also deal with system accounts and manage them. Also presentation section also consists of an interface, which is available to all the students and teachers registered in the system.

The application section handles all data processing in the system such as form data submitted by an user.

5.4 **APPLICATION LOGIC**

There are three participants in the system, Teachers, Students and administrator. This sections explains the logic and processes for each participant and also explains the interaction between these. The forth module, the content-module is considered to be an entity rather than a participant.

5.4.1 Page Templates

Structured design is one of the key concepts to improve and develop an easily maintainable web interface. This is accomplished by using smarty templates in the thesis. Using smarty the templates used are header.tpl, top-menu.tpl, left-section.tpl, right-section.tpl and footer.tpl. Since these templates can be used for entire system independent of the page and its functionality. Figure 5.2 shows the separate templates used. Because of this separation on templates the re-use of design becomes easier and does not block the logic of the system.

5.4.2 Login Process

As the users have profile specific access to the system components and restrictions to some part of the system depending on their access level, therefore an access based login
Figure 5.2. Generation of page through templates.

system was implemented. This system allows the teachers and students to register into the system and create a profile.

The user has to register in the system through registration form providing his/her details. A profile for each user is maintained with this information.

In the registration process, data is added to database and profile is maintained. After successful registration, an email is sent to user through PHPMailer object. Code, which creates the PHPMailer object and sends the email, is shown in Figure 5.3. If the user registers as a teacher then admin will be approving the access to all the teachers. After admin approval teachers will have privilege to add topics and moderate them. If the user is registered as a student then he/she will be able to render the topics and comment on those with teacher’s approval.

When the user tries to log into the system, his/her user and password are checked to determine if they exist in the user table or not. Then the system checks for the type of user. Based on the type of user, if the login procedure is successful, the application then checks for access privilege for the user in the user table, depending on the user type, features are displayed in GUI. The system needs to keep track of the user’s login state between the http
requests. There are two ways to keep state of users, either by cookies or sessions. Since cookies are disabled in many browsers, a session was used to keep state of users. Hence, a session variable with the user’s username is added to the session. Each time a request is made to the system, the session variable can be checked if it is set. If the session variable is set, the user is still logged in, else the user has logged out or the session has expired.

5.5 ADD TOPIC FUNCTIONALITY

Teachers can add new topics using the “Add New Topic” page which is selected from the menu section at the top left. Teacher can add the description in base language English and select the languages he/she wants for the students to render the topic. Basically Google translator provides these translations but teacher can edit this translation in his own words so that students can understand the topic well. Teachers can also upload the documents to support the topic. For security reasons the document formats allowed are (1) Presentation like PPT, PDF (2) Documents like DOC, DOCX, XLS (3) Images: JPEG, GIF, PNG, and BMP (4) Video like QuickTime, WMV and AVI.

After selecting the languages for a topic, teachers can also preview topic translation that appears for given language through Google translator.

For example the Preview of a Japanese language for a topic appears as shown in Figure 5.4.
The translate API is a global method that returns the translation of a text block. This API supplies a result object containing the translated text asynchronously via the result function.

The basic translation from Google translator is rendered by following code in Figure 5.5.

```php
$text = urlencode($text);
$destLang = urlencode($destLang);
$srcLang = urlencode($srcLang);
$sql = "select * from topics_description where topic_id=$topic_id and language_id='",$dest_lang,"'";
$result = $conn->query($sql);
$topic_data = $conn->fetch_array($result);
if($topic_data['topic_description'] != ''){
  $result = $conn->query("UPDATE topics_description SET topic_description = " . $query . " WHERE topic_id = $topic_id".
} else {
  $trans = file_get_contents("http://ajax.googleapis.com/ajax/services/language/translate?\t=1&key=$key&topic=$srcLang|$destLang\"");
  $json = json_decode($trans, true);
  if($json['responseStatus'] == '200')
    $result = $json['responseData']['translatedText'];
  else
    $result = 'Conversion not available.';
}
```

The Translation method is defined as follows: `text/content` specifies the text to be translated, either as a string or an object. `srcLang` specifies the BCP47 code for the language of the text to be translated. `destLang` specifies the code for the translation language.
5.6 Edit Translation

As the Native teachers need to teach the language, sometimes the Google translator does not provide grammatically correct translation in the language requested which creates a need to develop an interface that can provide the Google translation and users (teachers in our case) using this interface can edit the given translation to make it more readable which will enhance the understanding about the given topic. Hence, this interface was created so that teachers could edit the translation in his/her own native language as shown in Figure 5.6 and this modified translation is replaced for the actual Google translation in database. The modified data is rendered as shown in Figure 5.7. The snippet of the code which edits the contents and saves it to database is as shown in Figure 5.8.

Figure 5.6. Edit the existing translation.

The above code edits and replaces the translation provided by the teacher and stores it in database. The database has a column, which stores the code for language and renders the topic title and description according to the language code.

5.7 Common Attacks and Prevention Techniques Implemented

Attacks to web systems are the major concern area for most of the organizations and firms. Following are some of the attacks that are common and recognized. The prevention techniques to these attacks are discussed below.
5.7.1 Web Attacks

SQL injection: is a code injection technique that exploits a security vulnerability occurring in the database layer of an application. The vulnerability is present when user input is either incorrectly filtered for string literal escape characters embedded in SQL statements or user input is not strongly typed and thereby unexpectedly executed. [13]

Preventive Measure:

- No database queries contain data that is fetched from browser parameters.
- Not allowing invalid user to view, comment or add topics to our website.

Countermeasures:

- Warnings and errors in server side code should be disabled. In any condition or crash, the server side warning or code should not appear. The less information an attacker has about how the code functions before it are rendered as a web page, the less likely they are to compromise the system. Hence the ini_setting.php file was edited to disable all the errors and warnings by code error_reporting (0).
Unchecked Upload Attacks and Prevention: An unchecked upload attack occurs when a user is allowed to upload a file that may be executed by the server (as with a php file). There is no skill involved with this type of attack. An attacker simply uploads an executable file or a script and accesses it through their browser. The file may be a php script that gives the user full access to the file system or some other tool to aid in gaining further access to the system.

Preventive Measure:

- Specific formats of documents that includes presentation, documents, images and video are allowed in this system so that the attacker cannot upload executables to the system

Plaintext and Man-in-the-middle Attacks and Prevention: This type of attack is enabled by allowing non-enciphered traffic over the network, and more specifically, allowing non-enciphered usernames and passwords to be transmitted between the client and server. Prevention of this type of attack is no harder than enciphering critical data before it is sent Between the server and client. Though this is not necessary for most sites, it is highly recommended when dealing with usernames and passwords.
Preventive Measure:
- Password is encrypted and stored in database.

Email Attacks and Prevention: If a web application is to collect email addresses for any purpose, it is imperative that submitted emails are checked for validity, not only in initial registration, but also any time an email is to be sent. Another common attack against servers is to somehow gain enough access to modify email accounts, and then harvest sensitive information from forwarded emails.

Preventive Measure:
- During Registration, the user email-id is checked for its validity and if the validation of email is not successful then the user cannot register into the system.

5.7.2 Automated Attacks and Dealing with Botnets

A botnet is a collection of infected computers or bots that have been taken over by hackers and are used to perform malicious tasks or functions. A computer becomes a bot when it downloads a file (e.g., an email attachment) that has bot software embedded in it. A botnet is considered a botnet if it is taking action on the client itself via IRC channels without the hackers having to log in to the client's computer. [14]

Botnets usually perform the following tasks:
- Scan the server for open ports.
- Traverse and map the server's website.
- Attempt to exploit any page that passes variables through the browser, by query string or by html forms (automated sql injection attack).
- Attempt to find common pages that are generally insecure, even if they are not reachable from the website itself (default phpmyadmin subdirectories, vulnerable blog and forum software, etc.)
- Attempt to register themselves through any available forms as legitimate users, usually with spam advertisement oriented information.
- Scan the website for any additional information that may be used against the system later, or sold in list form (email addresses, personal information, etc.)

Preventive Measure:

Automated junk registrations can be avoided by using so called captchas – Completely Automated Public Turing test to tell Computers and Humans Apart. They are small PHP scripts that create a blurred view of a certain number of random letters and numbers as a small image. The user has to enter them because he is still able to identify them whereas a computer cannot. Before proceeding with a registration, the system compares the entered combination with the one created and aborts the process if they do not match. Captchas are an adequate safety mechanism
for averagely visited sites because they are easy to implement and offer enough parameters for an individual implementation.

5.7.3 Cryptography

Hash Functions

A hash function is an algorithm that computes a value based on a data object (such as a message or file; usually variable-length; possibly very large), thereby mapping the data object to a smaller data object (the "hash result"), which is usually a fixed-size value. Mathematically it can be defined as a function, which maps values from a large (possibly very large) domain into a smaller range. A 'good' hash function is such that the results of applying the function to a (Large) set of values in the domain will be evenly distributed (and apparently at random) over the range. [15].

The kind of hash function needed for security applications is called a “cryptographic hash function", an algorithm for which it is computationally infeasible (because no attack is significantly more efficient than brute force) to find either (a) a data object that maps to a pre-specified hash result (the "one-way" property) or (b) two data objects that map to the same hash result (the "collision-free" property). Examples of hash functions are: MD2, MD4, MD5, and SHA-1. For Our system passwords are hashed with SHA-1 and stored in database.

5.7.4 Server Security

Weak passwords can occasionally be guessed through brute force and dictionary attacks. In a Dictionary attack, the attacker connects over and over while trying different words from a list, usually containing common passwords, regular dictionary words, and names, as well as common “keystrokes” like “asdf”. In order to maximize password security, passwords should contain upper and lowercase letters, numbers and punctuation marks.

Measure taken: While registration the password policy applied is password must be at least 8 characters and must contain at least one lower case letter, one upper case letter and one digit.
CHAPTER 6

APPEARANCE AND FUNCTIONALITY

In this chapter, we will discuss the user interface and appearance of this website. Since users will access that will be using this website may be from remote areas The appearance of the website is maintained simple and more user friendly. The design is managed in such a way that any change in the functionality of the code will not change the design of the website and vice-versa. Please Refer: Appendix for Manual of instructions for detailed steps that elaborate steps on how to access entities of the system.

6.1 HOME PAGE

Home Page as shown in Figure 6.1, includes information about LARC and components that socially connect users with LARC department and this website. The left column include the forthcoming events from the department and Project areas that for the year 2010-2014 that LARC will work on. This website records ten recent twits from LARC twitter account to keep the user updated about the recent activities and forthcoming events. It also provides the follow us option on twitter and Facebook.

6.2 REGISTRATION AND LOGIN

The system provides ways to register as both as a teacher and as a student. If the user signs up as a teacher then administrator approval is required for the teacher. To sign up to the system, user has to fill in a form with appropriate data and valid username (email id) and password. If the form is valid the data is passed to function, which sends it to the database where it will be stored. And user gets an email on registered id to confirm the registration.

The registration form appears in Figure 6.2.

The details obtained from registration module are added to database table is users which is used to maintain the user profile and verification of user-id and password. The password is stored in hashed form as discussed in earlier chapter. These details are checked and reconfirmed when the user tries to login with the registered email id and password.
When a user logs in, the system checks for the role assigned to that user name and assign the appropriate privilege.

The flow chart given in Figure 6.3 explains the flow of the login process.

**6.3 Administration**

The administration of this website is handles by separate interface which approves the teachers in the system. Administers the topics added, also can delete the topics which they want. When a user registers as a teacher the admin authorizes the access, which enables the teacher to add topic to the system. The Administration has separate login and password to access this interface.

The interface with which the admin approves the teachers request is as shown in the below Figure 6.4. In this snapshot the Admin can approve and disapprove students and teachers.

Also the topic list and the authority to delete topics is a part of administrative privileges.

The Figure 6.5 shows the topic list and authority provided to admin for website maintenance.
Only the teacher can add topics to the topic list in the system. The students can only read or comment on the added topic. The steps for adding a lesson can be explained with the help of an algorithm shown below in Figure 6.6.

In this Algorithm, the teacher adds a topic to the existing topic list also can upload the documents to support the topic and select the languages that he/she want. This choice can depend upon the targeted students or the international students from the classroom so that the languages they speak can be included. The translation preview will contain the Google translated data of for the Title and the description as shown in Figure 6.7. The teacher can edit the translation or completely add a new one, to explain the topic. The format in which
Figure 6.3. Registration and login flowchart.

the teacher adds the topic is preserved. Once the teacher adds the topic the modified translation, if any, or the Google translation if not modified is saved to the database.

The topic can be updated later through edit option and other translations can be further added through the same.
6.5 COMMENTS AND THEIR MODERATION

As discussion forms an important part of learning and understanding of concepts, students and other teachers that are registered into the system are eligible to comment on the topics in the topic list. Teacher who added the topic moderates these comments. The teacher can approve or disapprove the comment. This feature was added in order to protect the comments from spam or irrelevant comments coming from other members registered in the system.

The comments part and teachers privilege is as shown in Figure 6.8. Where the teacher can disapprove and already approved comment, approve the newly added comment. Also the timestamps for these comments and the users adding the comments are saved with the comments in database.
Figure 6.6 Add topic algorithm.
Figure 6.7. Add topic interface.
Figure 6.8 Comments interface.
CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 CONCLUSION

This thesis mainly focuses on technology and combining the International Society on Technology Education and ACTFL’s Standards for Foreign Language Learning. It elaborates over how technology can be applied to create another solution for communicative language learning. In this scenario a language learning solution is presented in controlled and guided environments. Also, this thesis provides a good platform for language learning applications, which can be used to extend to additional usages.

7.2 FUTURE ENHANCEMENTS

Well-designed, architected, and implemented applications can also be made better if we add more features and if we enhance their functionality.

This thesis project has helped me learn a lot, and during the process of learning and working on this project, I found some things which could be done to make it even better and effective, which I would like to list:

- Entire Interface in the language can be rendered.
- Portability to mobile devices so that this interface is more approachable.
- Video chatting could also help really the process of learning by bringing teachers and students face to face, as they would be in the classroom.
- More features can be added such as interactive gaming, which will engage the learner.
REFERENCES


APPENDIX

GLOBALIZING OF TECHNOLOGY MODULE IN CONTEXTUALIZED LANGUAGE INSTRUCTION MANUAL
GLOBALIZING OF TECHNOLOGY MODULE IN CONTEXTUALIZED LANGUAGE INSTRUCTION MANUAL

Anjali Aglawe
1. Introduction

This website is intended for teachers from remote areas to interpret this module with ease in their respective language and present technology in a better way to those who are not well verse with the advanced and computerized teaching techniques. It is a simple and user-friendly website to connect with students and explain and elaborate them over concerned topics in their own language.

It has the following features:

Register into the system.
Maintain your profile.
View the topics added by teachers.
Add Topics with description and elaborate over each one in your own language.
Discuss over the topics through comments.
Edit the existing translation through Google.
Socially connect to the department of LARC through Follow us.
Get information about the recent activities of LARC.

2. Accessing the Website.

The link to access the website and login page of this website is:

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this can be accessed from any browser.

To enter the site, simply enter your User Id and Password, and click the ‘Log in’ button.

If you are new to this system and want to register and access the website please refer to section 2.1
2.1 First Time User

1. Click on the ‘Register’ link at top right of the web page.

2. Fill the registration form with valid details and your user type. (refer fig: 2.1)

3. Select the password to be at least 8 characters and must contain at least one Lower case letter, one upper case letter and one digit.

4. After clicking Register if you have valid registration, an email is sent to you at the Email-id you registered with.

5. For students, you can login into the system after valid registrations. The teacher has to wait for administration to approve his/her profile.
2.3 Forgot Password:
If you forget your password, click on the **Forgot Password** link on login page, which will get you to the following screen. Enter your email address on record with us and a new password will be mailed to you at the same email address.

[![Forgot password]](image)

**Figure A.3. Forgot password.**
After the Email is sent to you with first time login password. Please change it as soon as you login for next time. The link for reset appears at the top-right of the page when you login into the system. You will be redirected to the below screen to reset your password by clicking on the ‘Click here’ link.

[![Change password]](image)

**Figure A.4. Change password screen.**

3. Home Page
The Top menu consists of options Topic, Add New Topic (explained in later sections) and Contact Us.
The left hand side: consists of upcoming events from LARC dept. and 2010-2014 project areas that LARC would be working on and inks connecting to the same.

The Right section consists of ten latest Twitter feeds. The Follow us tab connect users to the link where they can follow LARC department and can follow the recent activities in LARC.

![Home Page](image)

3.1 Profile Management:
User can view, update and maintain profile created at the time of Registration.

Personal information and address information can be changed here

And will be updated in the system as well.

To View your “Profile” click on the Profile page at top-right corner of the home page.
4. Add New Topic (For teachers)

The Add Topic functionality is available only for teachers. If the teacher wants to add a topic to existing list steps are as enlisted below:

1. Navigate to the home page.
2. Click on menu item ‘ADD NEW TOPIC’.
3. Fill in the Topic-title and description for the added topic.
4. Select the languages you want the students to render the topic in. (If the user only selects the Language without editing its translation, the Translation rendered from Google Translator is saved to database.)
5. Optionally user can upload documents to support the added topic.
6. Select the option of Active for the topic, if teacher wants to display it to the topic list and make it editable for future. IF the teacher selects the topic as inactive the topic though will be added to the topic list but will be not available for editing later.

See the screenshot below in Figure 4. For the screen.

Navigation: Home Page > ADD NEW TOPIC.
4.1 Preview and Edit the Existing Translation

To add your own translation in the language Added for a topic,

Steps are as follows:

1. In the Add Topic sequence of steps when you select a language, click on the “Edit” link

Beside the language.
2. Edit or Replace the existing translation in the Description and title of the screen.
3. Click on Done to Return to the Add Topic screen and add the topic.

4.2 Edit the Existing Topic
The teacher who added the topic can edit topic, Add languages and add documents later. Also edit/replace the existing translation.

*Steps to Edit the Topic:*
1. Select the Topics option from the Topic List.
2. Click on the Title of The topic you want to edit. (Note: the teacher who added the topic Can only edit his respective topic.)
3. Click on the Edit option that appears at the top-right of the Manage topics pane.
4. Edit the contents you want and Click on the Update button to Save the changes made.

![Digital Natives And Digital Immigrants](image)

*Figure A.9. Edit topic option.*

5. Comments
Students and Teachers registered into the system can comment and discuss over any topic. Teacher who added the topic moderates these comments.
5.1. Post Comment:
To post a comment over a topic, Students should follow below steps:
1. Enter the Name, Email and comment for the topic.
2. Click on the “Submit” Button.
3. Wait for the comment to be approved by the teacher who added the topic.

![Add comment screen](image)

Figure A.10. Add comment screen.

5.2. Moderate Comments
The teacher can approve and disapprove the comments added on his topic by student. Unless the teacher approves the comment, it will not show up to any of the students Viewing the topic.

![Comment moderation](image)

Figure A.11. Comment moderation.