

KEMI-TORNIO UAS

Developing Website for International Business Economic
College of Wuhan Textile University

Liu Xin
Bachelor's thesis of the Degree Programme in Business Information
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KEMI 2011

ABSTRACT

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Establishing official website makes a crucial role for every university. To further improve the fame of college all over the world, strengthen the cooperation with foreign universities and searching for more channels of developing the college, the International Business Economic College of WTU assigned me to build a new website for them. The website was to be suitable for international exchange students.

The aim of this research was to build a suitable website for International Business Economic College (IBEC). This research included the following activities: (1) analyzing the current cases about how to build a college website, (2) implementing functions of the website which are appropriate for IBEC, and (3) building up a website with proper usability and functionality for IBEC.

This research relied on the constructive method. This method was found to be appropriate for this work because it has been widely used in software engineering and computer science. Furthermore, the key of constructive method is to build the artefact out through the reasonable steps.

In my work, the artefact is the website which I designed for IBEC. The main focus of my research was to design proper usability and functionality for the website.

Keywords: PHP, MySQL, JavaScript, HTML, CSS

ACKNOWLEDGEMENTS

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EXPLANATION OF CHARACTERS AND ABBREVIATIONS

IBEC	International Business Economic College
WTU	Wuhan Textile University
HTML	Hypertext markup language
CSS	Cascading style sheets
PHP	Hypertext Preprocessor
WAMP	Acronym of Windows, Apache, MySQL, and PHP.
UML	Unified Modeling Language

ABSTRACT

ACKNOWLEDGEMENTS

EXPLANATION OF CHARACTERS AND ABBREVIATIONS

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1 INTRODUCTION

1.1 Background information and motivation

In the summer 2011, I contacted many colleges in China for asking for a website development project for my bachelor's thesis. After one week, the college which is called International Business Economic College of Wuhan Textile University (henceforth IBEC) contacted with me. International Business Economic College is a part of Wuhan Textile University. This school not only enrolls the students from China, but also receives international exchange students all over the world. IBEC has the total number of 4650 registered students and 243 teachers. Furthermore, 40 percent of teachers are professors and 35 percent are doctors and masters. This school uses a SMT concept. It means that the school mainly focuses on the communication between students, mentors, and teachers. Additionally, IBEC has a huge number of programs designed for bachelor degree students, including International Economics, Accounting, Business, Administration, Information Technology, Marketing Management, E-business, Logistics, Mechanical Design, Biological Engineering and Advertising Design. (IBEC 2011.)

Today, official websites have become a most essential requirement for each college. In order to improve the IBEC's educational quality, the administrators considered involving new functions on their website. The original website for IBEC has the following basic functions: online enrollment, information sharing, and introduction of campus' facilities. Unfortunately, with a growing number of international exchange students in this college, the original website is not capable of satisfying the whole students' learning requirements. Therefore, the college asked me to build a new website for them. The layout and functions of the website should be available for local students and international exchange students.

For more details, the college sent me a commission in the following form:

Entrustment Agreement

To further promote the popularity of our college all over the world, strengthen the contacts with foreign universities and search for more channels of developing the college, the College Board agreed to entrust Mr. Liu Xin to design and establish an English website for us.

The website should be of characters as follows: simple operation, stable performance, fresh layout, and comprehensive Contents. The charges of producing the website should be decided by both sides later.

Entrustment Entity: International Business and Economic College, Wuhan Textile University

Address: Textile Road No.1, Hongshan District, Wuhan City, Hubei Province, China

Telephone: 86-27-50653178

Appendix 1. Contract

1.2 Structure of thesis

The thesis is divided into six chapters. Chapter 1 introduces the basic background of college and my motivation. Chapter 2 is written for research questions. Chapter 3 mainly focuses on the methodology and technical tools I used. Chapter 4 mentions the preparation and three kinds of models for the website. The website's layout and its functions are described in chapter 5. Chapter 6 is the conclusion.

2 RESEARCH TOPIC AND QUESTIONS

My final purpose is to build a website for IBEC. The beneficiary of this research is IBEC. In the beginning, my research focuses on collecting and analyzing data in order to find out how to build a successful website, which has characteristics of usability and functionality. The data of my research were collected from Chinese renowned universities' websites, web developers and users involved IBEC. Therefore, I could get a basic idea of the website.

What functions are needed for college websites?

Firstly, in view of website design for international students, an English-speaking environment is needed. The college website must contain the basic functions as follows: providing the general information about college, displaying students' work, advertising events and activities of school, providing course information and feedback. Secondly, based on the result of communication between IBEC and me, the college expected that I designed some new functions which were available for international students, such as, online register. In general, based on this question, I figured out that all the functions should be included in the website.

How can I plan usability for college website?

Usability is another essential element for a website. A well-structure website within usability can leave a good impression on users. For the purpose of adding usability, there are some aspects should be considered in website establishment, such as, user-friendly layout, a proper navigation bar, constructional overall arrangement. The previous experience that working on establishing online market center taught me that I should analyze clients who frequency visited official college websites firstly. In other words, the site should be constructed mirror users' tasks and their views of the

whole website (Nielsen 2000).

Which development environment satisfies developing a college website?

Web development environment could be generally divided into those aspects: (Windows+Apache+MySQL+PHP) WAMP, (Linux+Apache+MySQL+PHP) LAMP, (UNIX+Tomcat+Oracle+JSP) J2EE and (windows+IIS+SQLserver+ASP) ASP.net. to solve this question, I would compare advantages and disadvantages of various development environments to choose the most suitable one from.

3 RESEARCH METHODOLOGY

3.1 Research methods

My thesis is the practical work about website development. The constructive method is one of the good choices for me since it had been widely used in software engineering and computer science (Shaw 2001). Järvinen (2004) suggests that: “the basic aim of constrictive research is to study reality and create or test theories about it. In general, the question is: Does it work?” This suggestion points out that my final goal of this research is to create a useful website for IBEC. In general, the constructive method is a good method for designing software and websites.

The general process of constructive method in software engineering is illustrated in Figure 1:

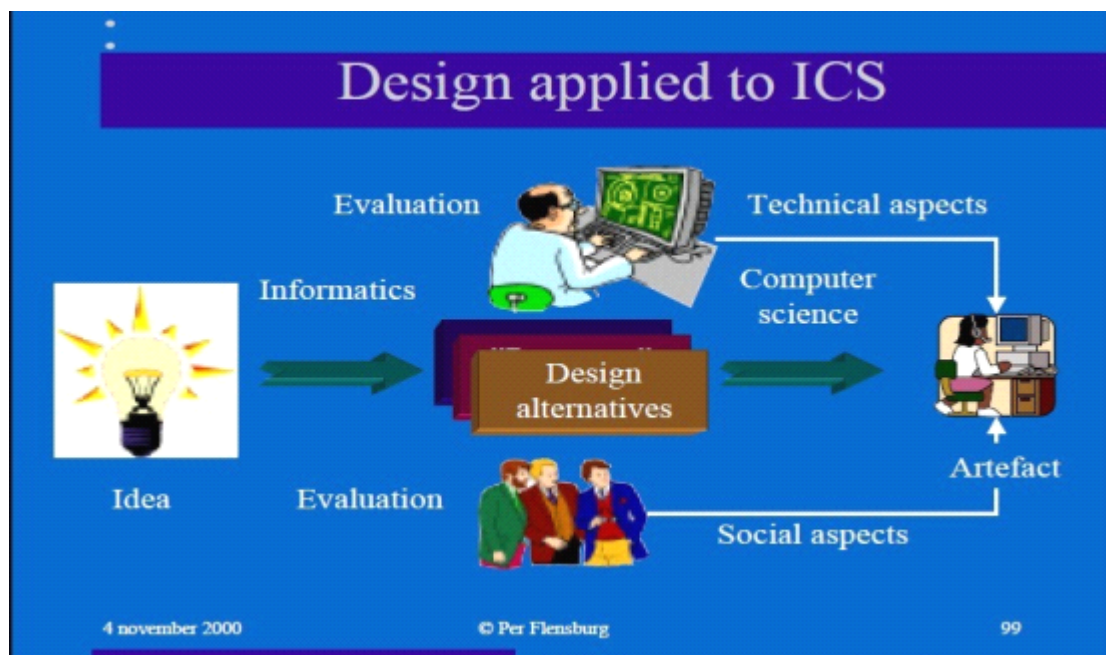


Figure 1. Design applied to ICS (Järvinen 2004)

There are several steps involved in the processes, including coming out a new idea, evaluating current information, and finally building out this artefact by technical

aspects. Base on this method, at the beginning of my research, I got a basic idea about my topic. The following step is to evaluate the model and construction. UML was a helpful tool which I could use at this stage. Therefore, the basic construction of the website was coming out. In the next stage, considering the knowledge that I had learned in college, I discussed the detailed technical theories which were used in practical with my supervisor. I had strong confidence to solve the problems that probably happened in the process.

As I mentioned above, a good website requires not only functionality but also usability. The interview was chosen in this case. Because, in answering the question of " How can I plan usability for school website?" the content of answers requires more technical skills. It means the respondents need to have some basic IT knowledge. Therefore, a face-to-face interview can collect more professional data in depth field since "Personal interview surveys are recommended when your desired sample consists of respondents in a very specific target population (SuperSurvey 2006)." However, there are also problems about interview as follows: (1) cost, (2) bias, (3) types of questions possible, and (4) attitude (Barribeau et al. 2005). To reduce the cost and bias, I will choose my supervisor as respondent. To avoid the third disadvantage, the question about personal information will be avoided or asked in a euphemistically way. In personal interviewer my attitude should be active. From my knowledge, an interview should be arranged as early as possible. In the interview my question will be explained politely and clearly.

3.2 Technical tools

Lastly, I explained some technical aspects which I have used during my work.

HTML and CSS

HTML is a hypertext markup language. In general, websites are text file. The main purpose of HTML is to mark each part of websites through tags. Therefore, the browser can understand how to display content of web pages. It provides the basic construction information for browser. (Shannon 2011.)

Cascading style sheets (CSS) is a tool for markup language like HTML, XHTML. The function of CSS is to present the outlook and formatting of websites written in a markup language. (w3shcools.com 2011.)

PHP

PHP is a server-side scripting language and can be embedded into HTML. It means PHP code is inserted into the HTML that makes up a website (PHP.net 2011). When a visitor comes to scans the website, the code is executed. Because PHP is a server-oriented technology, the user does not need any special add-ons to see the PHP in action. It is like a bridge between your database and websites. If you want to design dynamic web pages, PHP is required.

UML

Unified Modeling Language is a standardized general modeling language for object-oriented software (Braun & Sivils & Shapiro & Versteegh 2000). For example: in my case, PHP is one of the object-oriented languages. I used UML to draw basic structure of my website through the class diagram, and to draw basic function flow through the activity diagram, user case diagram. UML can help me to get the

blueprints of my website.

JavaScript

JavaScript is an interpreted programming language or script language. Regev(1998) pointed out that “JavaScript uses some of the same ideas found in Java, the compiled object-oriented programming derived from C++.JavaScript code can be also embedded in HTML pages and interpreted by the web browser.” JavaScript can make the outlook of your pages more dynamic. For instance, it automatically changes a formatted date on a web page, cause a linked-to page to appear in a popup window, cause text or a graphic image to change during a mouse rollover.(Regev 1998.)

MYSQL

MySQL is a relational database management system based on a structured Query language (searchenterprise.com 2001). Due to the fact that it is an open source database, MySQL is cheaper than other type of databases. However, the low price does not mean that MySQL would lack some functions compared with other professional databases. MySQL runs on virtually all platforms, including Linux, UNIX, and Windows. It can provide multi-connection from users to access to multiple databases. The most important reason that I choose MySQL is that it could cooperate perfectly with PHP language. (Eng & McCprmack 2001.)

Dreamweaver

Adobe Dreamweaver is a code-oriented language, which provides visual interface when users create standard-based websites. The application platform of this software includes desktop, smartphones, tablets and other devices. Since it has visual front page function, this software could save my time for designing. It means when I remove or change some layouts on the front page, the original code is also changed

automatically. (adobe.com 2011.)

CKEditor

CKEditor is a text editor to be applied inside website. This software is capable of transferring any text format into a new format that the programmers would like to utilize. Furthermore, CKEditor is authorized under flexible open source and commercial licenses (CKEditor.com 2011). So that, I was free to use it. Here is the example that how I used it. After I put the article into the software, CKEditor would translate the contents with HTML and CSS code. I simply stored it into my database for getting a formal standard of the article.

Editplus

I decided to use Editplus to design my PHP and HTML code, since it contained seven features. 1, Auto backup, when I stored my work, this software would automatically backup a new field for me. 2, Syntax highlighting, this software supports syntax highlighting for PHP, HTML, and CSS code. It permitted me to locate the syntax mistakes conveniently 3, Hex Viewer, The Hex Viewer allowed me to display current file in Hex mode. I can translate between normal editing window and the Hex Viewer with one command.4, Code Folding, it supported fast and convenient code folding feature based on line indentation. Therefore, I can hide or display lines of code with its indent levels. 5, HTML toolbar, The HTML Toolbar allowed me to insert common HTML tags quickly and easily. It also supported useful tools such as HTML Color Picker, Character Picker, Table Generator and Object Picker. 6, Document selector, The Document Selector offered shortcut access to all document windows currently loaded, which is much faster than selecting on Window menu or pressing Ctrl+Tab key multiple times.7,User tools, EditPlus supports user-defined tools, help files and keystroke recording files. The output of tool execution can be captured in the output Window, therefore, I can double-click the error line to load the file and locate the

cursor to that line automatically. (Editpluse.com 2011.)

WAMP

WAMP is acronym of Windows, Apache, MySQL, and PHP. WAMP is development environment. WAMP refers to a set of open source application. It runs at Microsoft Windows, which are commonly used in web server environment. The WAMP offers developers with four elements including operating system, database, web server and web scripting software. The combined usage of these programs is called a server stack. In this stack, Microsoft Windows is the operating system, Apache is the web server, MySQL is the database components, while PHP is the dynamic script languages. (WEBOPEDIA 2011.) In my work, I used WAMP server 2.0 for designing college's website.

4 DEVELOPMENT MODELING AND PREPARATION

4.1 Basic div structure

Based on the constructive methodology, I came out with the basic idea about the primary process of designing a college website. My first step was to get the general idea about the college website. This step involved some aspects: 1.The basic layout and construction of the website, 2. Basic classes for each element on the website, and 3.Basic database construction which related on some primary functions. I used UML modeling to prepare those three aspects. During the first week of writing my thesis, I collected the information about basic ideas of the website's layout. In order to apply clear layout to the website, I constructed the clear framework and avoided the redundant feature of web page. After discussing with my supervisor, I drew the construction of the website in the beginning. Figure 2 is the fundamental construction of the homepage.

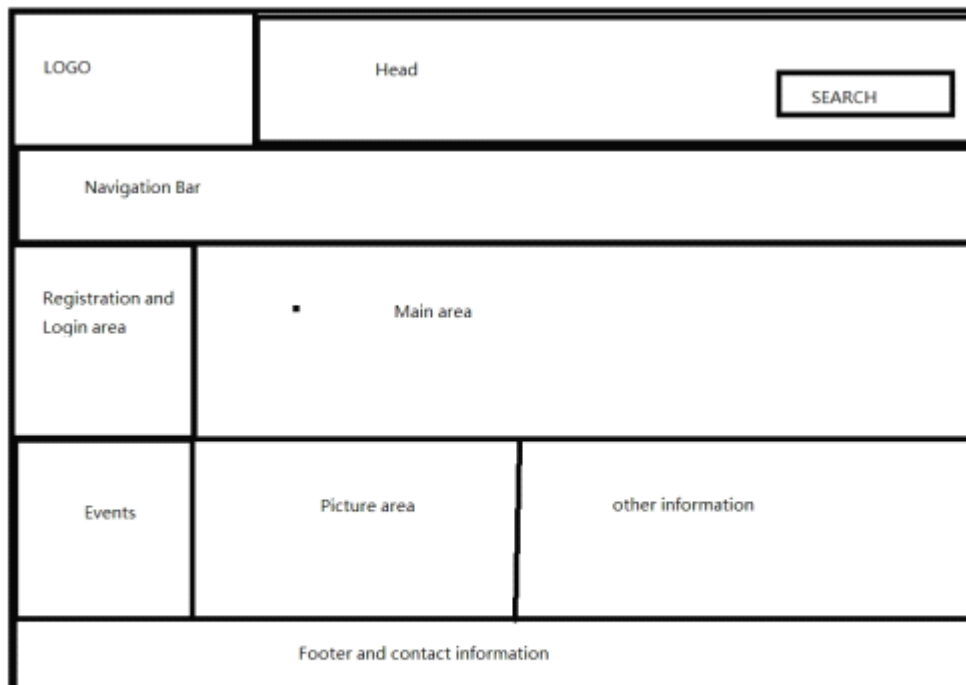


Figure 2. Homepage div structure

Figure 3 is the basic construction of the registration page.

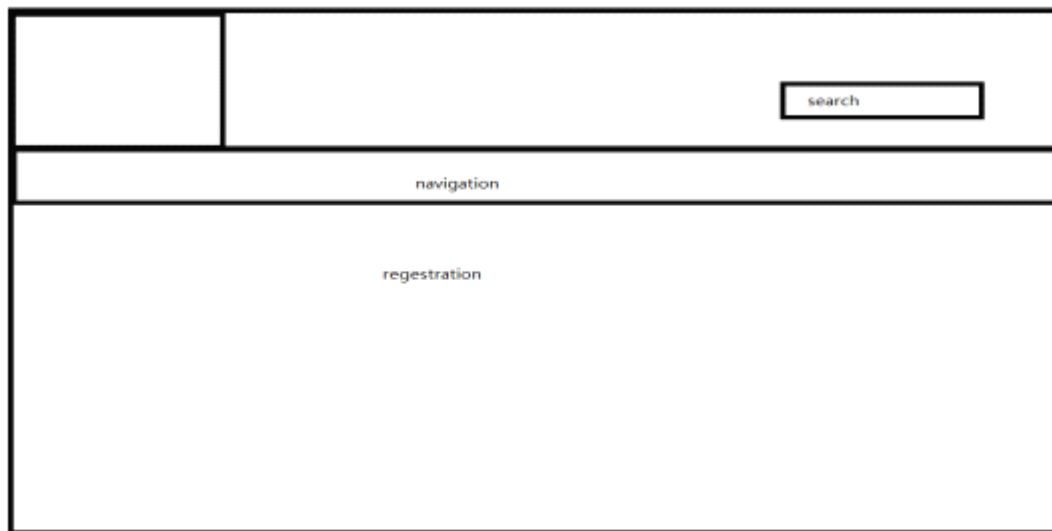


Figure 3. Registration page div structure

Those two figures show the div structure of my website. I also marked the name on each div tag. This step was needed before I designed the functions, since my PHP codes were embedded in this framework.

4.2 Class diagram and database class

Furthermore, the next step was to find the classes and functions for database. The primary functions required from the college are as follows: login, registration, articles' show, message board, and internal site search. As a result, I designed class diagrams by UML for my database and functions. A class diagram is widely used to describe the types of objects in a system and their relationship. It models class structure and contents using design elements such as class name, attributes and operations (Braun & Sivils & Shapiro & Versteegh 2000).

Figure 4 showed some essential classes, which need to be stored in database by class diagram.

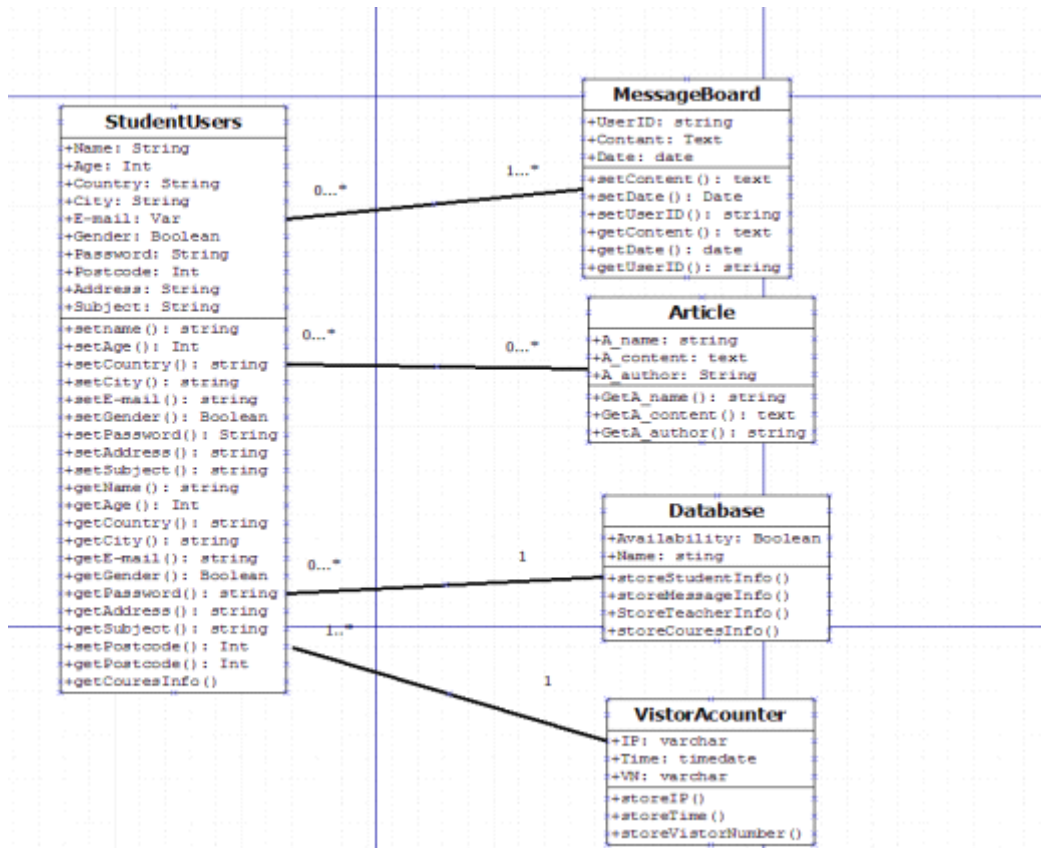


Figure 4. Class diagram for my website

Figure 5 is the class diagram from manager's point of view.

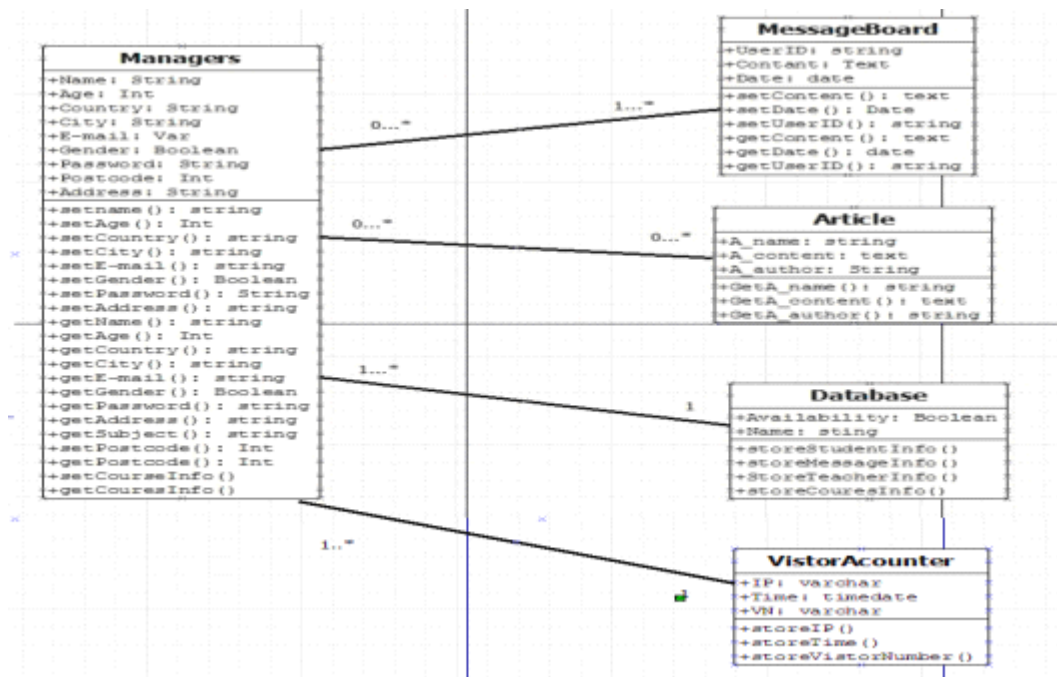
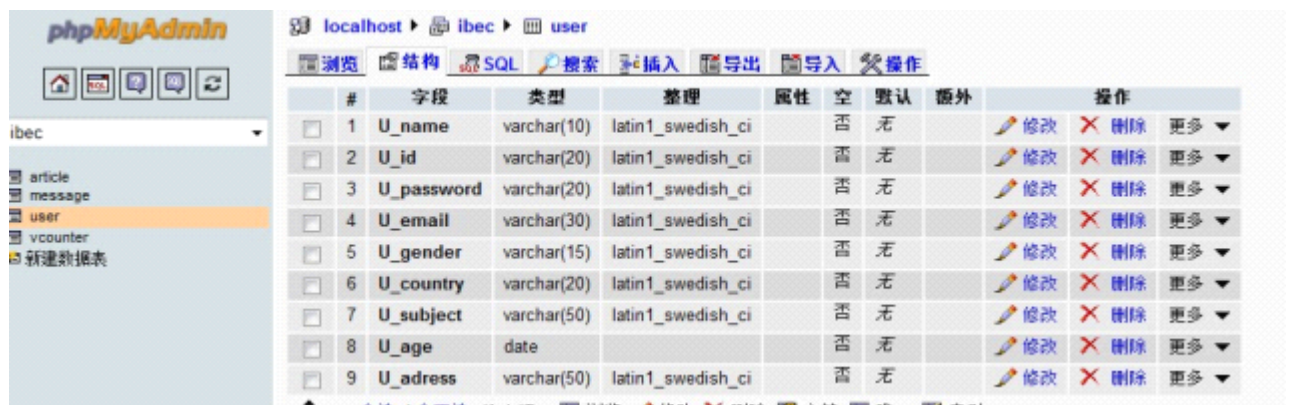


Figure 5. Class diagram of my website

According to those two diagrams, I could set my database classes clearly and

precisely. There are six primary tables which are as follows: users table, article table, message board table, visitor account table and picture table.

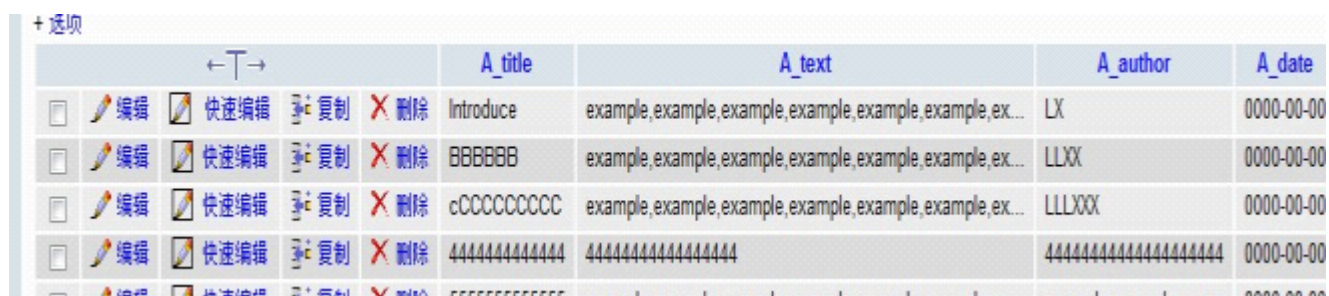
The user table pertains to storing personal information. As part of database (Figure 6), the user table has nine different fields, i.e. U_name, U_id, U_password, U_email, U_gender, U_country, U_subject, U_age, and U_address. One thing should be pointed out is that there is a big difference between U_id and U_name. U_name refers to student name and U_id represents their username for logging in the system.



#	字段	类型	整理	属性	空	默认	额外	操作
1	U_name	varchar(10)	latin1_swedish_ci		否	无		修改 删除 更多
2	U_id	varchar(20)	latin1_swedish_ci		否	无		修改 删除 更多
3	U_password	varchar(20)	latin1_swedish_ci		否	无		修改 删除 更多
4	U_email	varchar(30)	latin1_swedish_ci		否	无		修改 删除 更多
5	U_gender	varchar(15)	latin1_swedish_ci		否	无		修改 删除 更多
6	U_country	varchar(20)	latin1_swedish_ci		否	无		修改 删除 更多
7	U_subject	varchar(50)	latin1_swedish_ci		否	无		修改 删除 更多
8	U_age	date			否	无		修改 删除 更多
9	U_address	varchar(50)	latin1_swedish_ci		否	无		修改 删除 更多

Figure 6. User table

The article table is a table that stores research materials and events. As a result of figure 7, the fields of A_name, A_author, A_text, and A_date belong to this table. Furthermore, the article list is ordered by A_date.



	A_title	A_text	A_author	A_date
	Introduce	example,example,example,example,example,example,ex...	LX	0000-00-00
	BBBBBB	example,example,example,example,example,example,ex...	LLXX	0000-00-00
	cCCCCCCCCC	example,example,example,example,example,example,ex...	LLLXX	0000-00-00
	44444444444444	44444444444444444444	44444444444444444444	0000-00-00
	CCCCCCCCCCCC	example,example,example,example,example,example,ex...	example,example,example	0000-00-00

Figure 7. Article table

Figure 8 is the message board table. It is used to store registered users' comments. The

main elements of this table are id, user, title, text, and last date. Moreover, id field has been given an extra attribute which is “auto increment”. As a result it will be automatically increased by one after every new record is inserted into the table. This process is able to order the comment list by their id. The last_date stores the last time when the data have been modified

#	字段	类型	整理	属性	空	默认	额外	操作
1	id	tinyint(1)			否	无	AUTO_INCREMENT	修改 删除 更多
2	user	varchar(25)	gbk_chinese_ci		否	无		修改 删除 更多
3	title	varchar(50)	gbk_chinese_ci		否	无		修改 删除 更多
4	content	tinytext	gbk_chinese_ci		否	无		修改 删除 更多
5	lastdate	date			否	无		修改 删除 更多

Figure 8. Message table

There are two special types of table, i.e. Vacount table and picture table. Vacount table is to store the number of visitors. This table has three fields which are visitor number, visitor’s IP and time. IP field and time field are built to defend spamming. For more details, I will describe in the function part of my thesis. Picture table stores the relevant path of the image.

#	字段	类型	整理	属性	空	默认	额外	操作
1	VN	varchar(5)	latin1_swedish_ci		否	无		修改 删除 更多
2	ip	varchar(20)	latin1_swedish_ci		否	无		修改 删除 更多
3	time_at	datetime			否	无		修改 删除 更多

#	字段	类型	整理	属性	空	默认	额外	操作
1	picture	varchar(100)	latin1_swedish_ci		否	无		修改 删除 更多

Figure 9. Vacount table and picture table

4.3 Use cases

Use cases are used in almost every project. Use cases are helpful in exposing requirements and planning the project. During the initial stage of building a project,

the majority of use cases should be defined, but as the project continues more might become visible. Figure 9 below has two main elements about cases and actors. A use case is a set of scenarios that describes an interaction between a user and a system. (Braun et al. 2000.)

Due to the purpose of the college website, the user case is much simpler than some commercial websites. There are two roles in the user case diagram which are as follows: guests, and registered users. Registered users own higher authority than guests. Figure 10 shows users in details. It needs to be pointed out that a registered user is the extended role of guest, which means that registered users had these six authorities. On the contrary, the guests do not have authorities of login, leaving messages and view messages. A guest could become a registered user by registration.

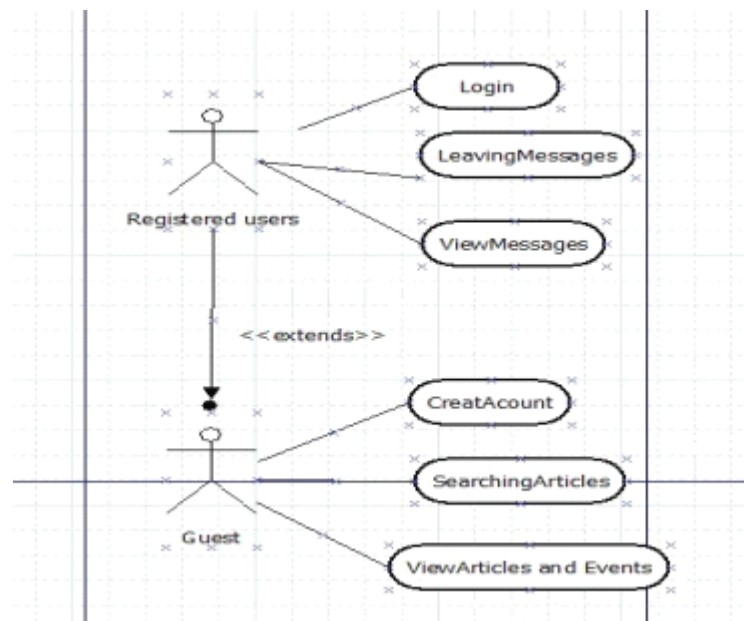


Figure 10. Use Case Diagram

4.4 Activity diagram for basic functions

Activity diagrams describe the basic workflow behavior of the website. The diagrams describe the state of activities by showing the sequence of activities performed. Activity diagrams can show activities that are conditional or parallel. Therefore the main purpose of activity diagrams is to model the workflow behind the

system being design. (Braun & Sivils & Shapiro & Versteegh 2000.) An aspect that needs to be emphasized here is the fact that this diagram does not give the details about how objects behave. Figure 11 shows the workflow of registration.

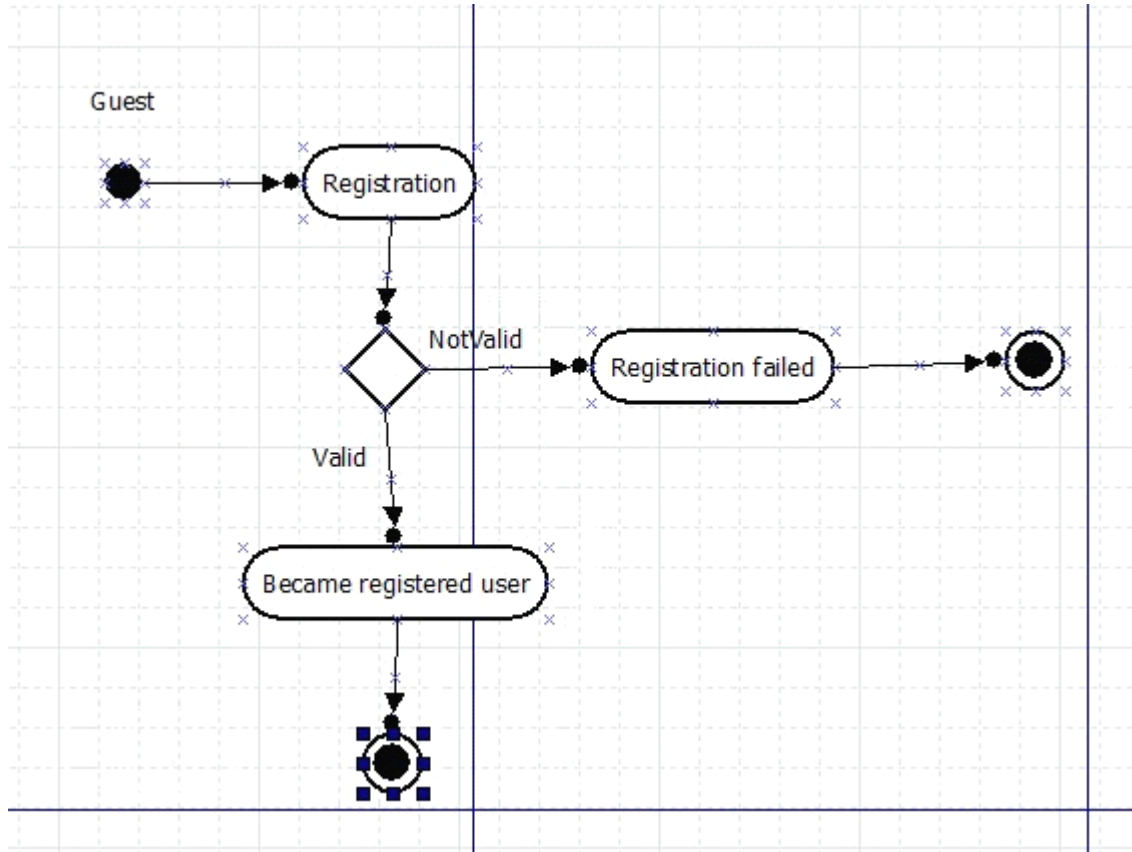


Figure 11. Activity diagram of Registration

Guests can become registered users through registration. There are many limitations during the validation part. For instance, guests cannot create IDs, which existed. The two typed strings filling in password form should be the same. Otherwise the registration will be failed.

Figure 12 points out the workflow about message board. Only registered users are able to go to this page and leave a message. Therefore, the users need to log in first. The administrator has the rights to delete all messages, but registered users can only delete their own messages.

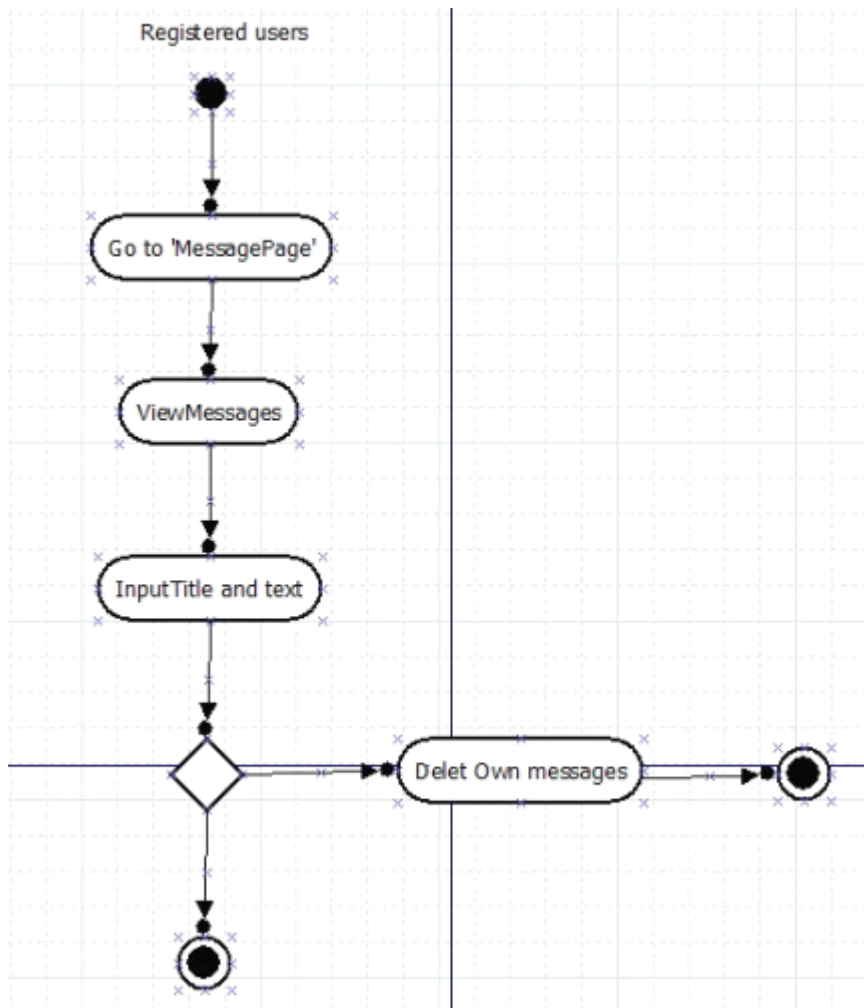


Figure 12. Activity Diagram of Message board

Figure 13 shows the workflow of searching. Both guests and registered users can use this function.

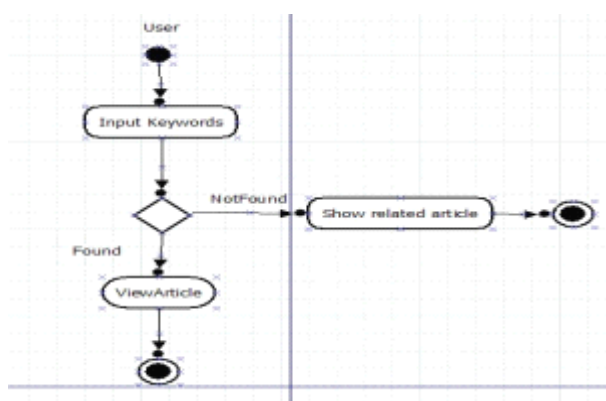


Figure 13. Activity Diagram of Searching

5 LAYOUT AND FUNCTIONS DEVELOPMENT

5.1 User interface

The user interface is the part of a computer and its software that people can see, hear, touch, talk, or otherwise understand (Nielsen 2000). The layout of the college website leaves first impression on users. As a consequence, this aspect needs to be considered during the whole process. This is a kind of web usability. As figure 14 shows, usability is not a single, one-dimensional property of a user interface, but it has multiple components and is traditionally associated with the following five usability attributes. (Nielsen 2000.):

1. Learnability
2. Errors
3. Efficiency
4. Satisfaction
5. Memorability

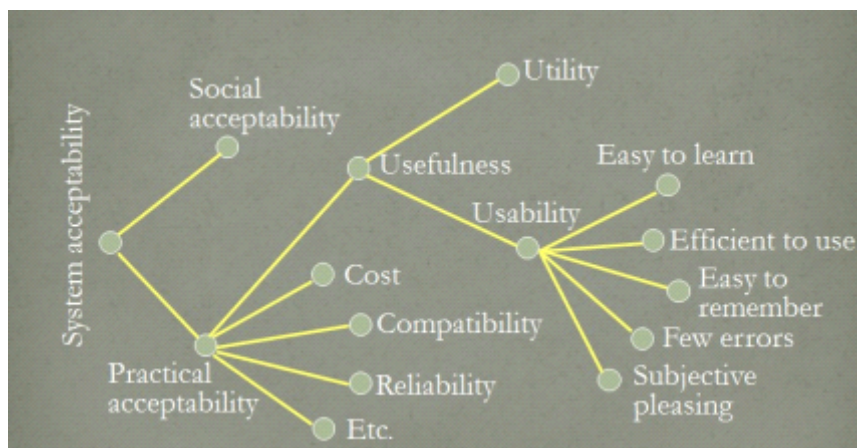


Figure 14. A Model of the Attributes of System Acceptability (Nielsen 2000)

Educational websites are different from the commercial websites. The layout of a university website needs to be fresh without any advertisement. In order to achieve it, my website for the college should reach this purpose. I used Dreamweaver which

helped me achieve my primary goal about layout. My website's layout is shown in Figure 15.

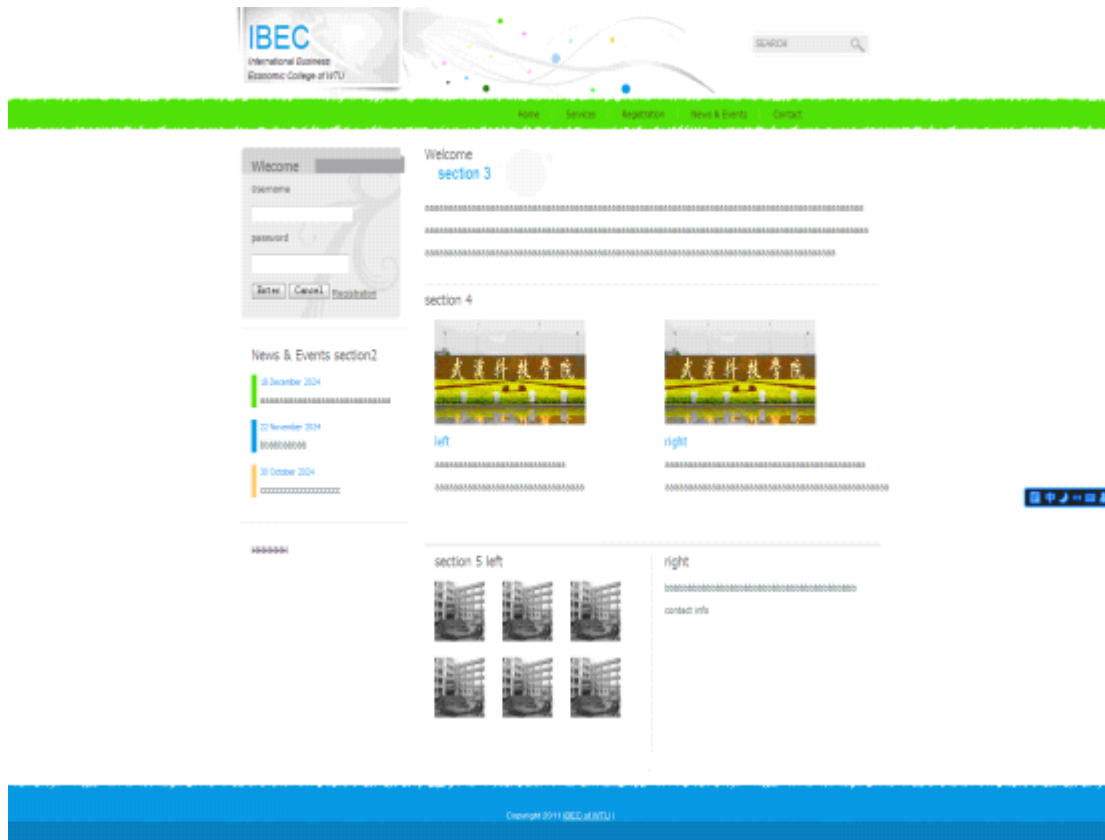


Figure 15. Homepage.

Figure 16 showed the layout of registration page.

The image shows a web registration page for IBEC (International Business Economic College of NTU). The page has a green header with the college's logo and navigation links: Home, Services, Registration, News & Events, and Contact. The main content area is a registration form with the following fields: Username (with a circular icon), Password, Confirm Password, Your Name, Your Birthdate (Year, Month, Day), Gender, Sex, E-mail, Address, Subject, and Country. At the bottom of the form are 'Cancel' and 'Submit' buttons. The footer is a blue bar with the text 'Copyright 2011 IBEC at NTU'.

Figure 16. Registration Page

To achieve the fresh style, I chose white, green, and blue to be the main color of my background. Moreover, on the basis of the div structure which was discussed at chapter 4, I found one free CSS template from open sources website (templatemo.com 2011). However it only has the homepage and the div construction of this template is too complicated. To make it suitable for the requirement, I used Dreamweaver to reset and modify some div tags. So, the work of Dreamweaver is to modify the div structure, tables and CSS. For example, On the basis of my plan, the homepage contains four main content areas, which are div (head), div (menu), div (main content), and div (footer). The head area was used for demonstrating the college's name and the search bar. In the main content area, there are also four sections to be arranged in contents. Furthermore, section four also has four more subsections for different purposes. The foot area was created for showing the copyright and visitor accounts. The navigation bar of my website is set for linking four different pages, which is registration.php, messageboard.php, contact.php and article list.php. In addition, there are also some other pages on the subpages. I drew the web structure molding to make it more clearly. Figure 17 illustrates:

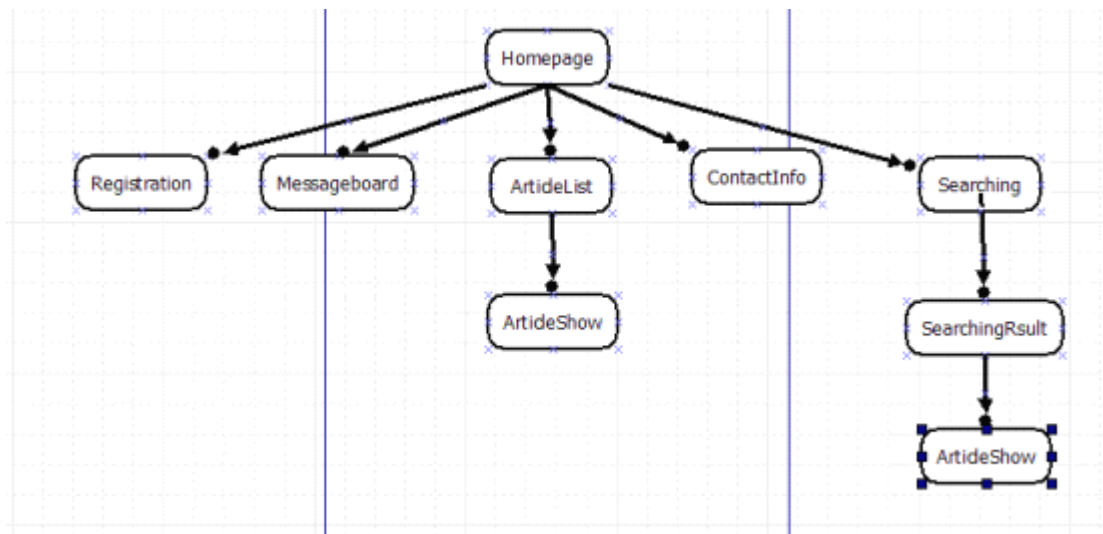


Figure 17.Web structure molding

Lastly, this CSS template is free to use and really saved my time. Free CSS Templates are provided by templatemo.com as free download for everyone. All CSS Templates are absolutely free to be downloaded, modified and applied for the websites without restriction. All of them are W3C standards-compliant free CSS templates (templatemo.com 2011). The original CSS template is shown in figure 18.



Figure 18. Free CSS Template (templatemo.com 2011)

5.2 Functions

I inserted new functions on the website following a reasonable sequence so as to allow their cooperation more effectively. By discussing with my supervisor, I determined that functions such as registration, login and session should be put in the

first place in website establishment. The page dividing function, article show function, and, message board function are the core functions which the college website included. Finally, I completed last two functions: the visitor accounting function and searching function.

5.2.1 Registration

IBEC needs to verify the personal information of exchange students. In the function part, I inserted nine variables for users' data. There are username, password, student, name, date of birth, country, address, gender and E-mail address separately. Figure 19 indicates the variables which are relevant to each user's information.

```
<?php
require_once('db/connect.php');
session_start();
if(isset($_GET['act']) && $_GET['act']=='ur')
{
    $U_id = $_POST['UserID'];
    $U_password = $_POST['Password'];
    $U_name = $_POST['Username'];
    $U_year = $_POST['year'];
    $U_month = $_POST['month'];
    $U_day = $_POST['day'];
    $U_temp_day=$U_year.'-'. $U_month.'-'. $U_day;
    $U_age=date('Y-m-d',strtotime($U_temp_day));

    $U_address = $_POST['Address'];
    $U_email = $_POST['Email'];
    $U_subject = $_POST['Subject'];
    $U_gender= $_POST['Gender'];
    $U_country= $_POST['Country'];
}
```

Figure 19. Variables for each field

For receiving users' data, I designed a form written by HTML. The form pertains to receiving each value of users' input data and storing the values in variables. Figure 20 illustrates the source code of HTML and the layout. Furthermore, to make the date of birth was easier inserted, I designed a simple loop function for this aspect by JavaScript.

```

<input class="input" type="password" name="Password" size="20" maxlength="25" value="" />
<br>
<input type="password" name="Confirmpassword" size="20" maxlength="25" value="" />
<br>
<input type="text" name="Username" size="20" maxlength="25" value="" />
<br>
Your Birthday<br>
<input type="text" name="Year" />
<input type="text" name="Month" />
<input type="text" name="Day" />
<select name="year" id="year">
<script>
for (i=1900;i<2011;i++){
document.write("<option value='"+i+"'>"<i>"+i</i>+<br>")
}
</script>
</select>
<br>
<select name="month" id="month">
<script>
for (i=1;i<12;i++){
document.write("<option value='"+i+"'>"<i>"+i</i>+<br>")
}
</script>
</select>
<br>
<select name="day" id="day">
<script>
for (i=1;i<31;i++){
document.write("<option value='"+i+"'>"<i>"+i</i>+<br>")
}
</script>
</select>
<br>
<select name="Gender">
<option value="Male">Male</option>
<option value="Female">Female</option>
</select>
<br>
E-mail<br>
<input type="text" class="input" name="Email" size="25" maxlength="50" value="" />
<br>
Address<br>
<input type="text" class="input" name="Address" size="25" maxlength="50" value="" />
<br>
Subject<br>
<input type="text" class="input" name="Subject" size="25" maxlength="50" value="" />
<br>
Country<br>
<input type="text" class="input" name="Country" size="25" maxlength="50" value="" />
<br>
<input type="reset" class="button" name="Reset" value="Cancel" />
<input type="submit" class="button" name="Submit" value="Submit" />
</form>
<br>
<div class="h_line" style="margin: 0px auto; text-align: center;></div>
</div>
</div>

```

Figure 20. Form for getting value

In general, the data of personal information will be stored in database directly. But there is a situation should be considered. For instance, Users cannot create a new account when this username exists. Figure 21 points out that if a username is not valid, the page will indicate an error message “username existed” and then refresh the page.


```

$sqlur="select * from user where U_id='$U_id'";
$result=mysql_query($sqlur);
$num=mysql_num_rows($result);
if($num>0)
{
echo "<script>window.alert('username existed');window.location.href='registration.php';</script>";
}
else
{
    $sql = @mysql_query("INSERT INTO `ibec`.`user` (`U_name`, `U_id`, `U_password`, `U_email`, `U_gender`, `U_country`, `U_subject`, `U_age`,
    `U_address`) VALUES ('$U_name','$U_id','$U_password','$U_email','$U_gender','$U_country','$U_subject','$U_age','$U_address')");
    mysql_query($sql) or die("<script>window.alert('registration done');window.location.href='index.php';</script>");
    die("<script>window.alert('failed');window.location.href='user_registration.php';</script>");
}
}
}

```

Figure 21. Insert data

Password is also a significant component of registration. I used MD5 algorithm to encrypt user password, the sample of source code is listed as follows. The example is shown below:

```

var junk_output;
md5hash(password1, document.forms.register.password_md5, junk_output, 0);
md5hash(password2, document.forms.register.passwordconfirm_md5, junk_output,0);

```

This function assisted users to encrypt their passwords into MD5 code to increase the security of their passwords. Furthermore, users need to type their passwords twice to avoid the typing errors.

5.2.2 Login

Login part was applied on the homepage. I used HTML and CSS to set the login table. There are two types of login parts which are different on the user's status. They are illustrated in figure 22.

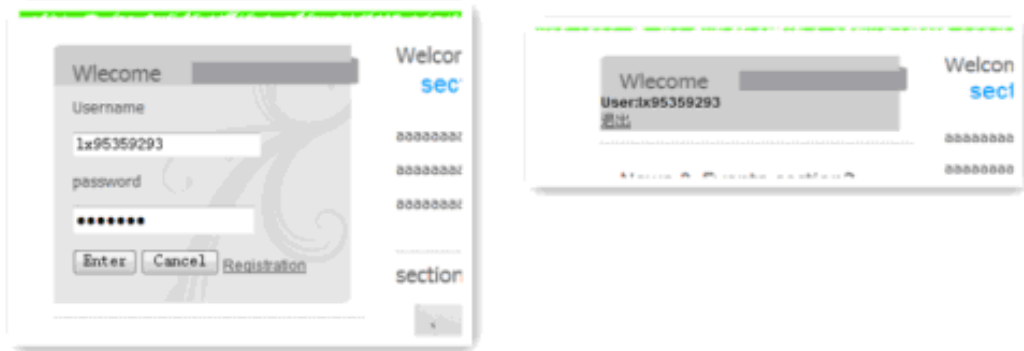


Figure 22. Before login and after login

I used PHP to identify the username and password. When user login is managed successfully, website would indicate message “login successful”. In addition, the function would automatically adjust the layout of the login table. I used “if.....else” syntax to verify if whether website got the ‘act’ value, a MySQL sentence of “select *from user where U_id=’\$userID’ ” would be executed. If data are matched, values of set session (u_id and U_name) would be adjusted as same as the string that user types before.

```

    if(isset($_GET['act']) && $_GET['act']=='login')
    {
        $UserID=$_POST['Username'];
        $Password=$_POST['Password'];
        $sql="select * from user where U_id='$UserID'";
        if($rs=mysql_query($sql))
        {
            if($rows=mysql_fetch_array($rs))
            {
                if($rows['U_password']==$Password)
                {
                    $_SESSION['U_id']=$rows['U_id'];
                    $_SESSION['U_name']=$rows['U_name'];
                    echo "<script>alert('login success');window.history.back();</script>";
                }
                else
                {
                    echo "<script>alert('password is wrong');window.history.back();</script>";
                }
            }
            else
            {
                echo "<script>alert('Userid is wrong!');window.history.back();</script>";
            }
        }
        else
        {
            echo "<script>alert('unknow error ocured when connect to datebase');location.href='index.php';</script>";
        }
    }

```

Figure 23. Login identify

5.2.3 Session

In my opinion, the main function of the session is to let website know who you are.

For instance, once the user logged in successfully, he was capable of visiting any page of the system under his authorization. Different users have various kinds of authorization to visit the website. For example, registered users are allowed to use message board. However, guests cannot visit the message board page.



```

index.php x
0 10 20 30
1 <?php
2 require_once('db/connect.php');
3 session_start();
4
5
6
7
8
9
10
11 if($rss=mysqli_fetch_array($rs))
12 {
13     if($rss['U_password']==$Password)
14     {
15         $_SESSION['U_id']=$rss['U_id'];
16         $_SESSION['U_name']=$rss['U_name'];
17         echo "<script>alert('already login');window.history.back();</script>";
18     }
19     else
20     {

```

Figure 24. Session function

In figure 24, Session needs to be declared before any code was implemented. For instance, after a user logins, the user' Id and name would be stored in “\$_session []”. As a result, after the functions analyzing the value of “\$_session []”, the website recognizes various users' authorization.

5.2.4 Page Dividing

Paging dividing function was developed as a foundation of articles function and message board function. In figure 25, Variable “\$pagesize” restores the titles that shows in the same page. The workflow of paging dividing function is: (a) Fetching out the URL (\$url) and analyzing it. (b) Giving a new value to “\$url”. (c) Counting how many data in total.

```

require_once('db/connect.php');
$pagesize=5;
$url=$_SERVER["REQUEST_URI");//Get URL
$url=parse_url($url);//analysis URL
$url=$url['path'];//give now value to URL

$numq=mysql_query("SELECT * FROM `article`");
$num=mysql_num_rows($numq);//accounting how many data in total

```

Figure 25. Get URL

Furthermore, in figure 26, the value of “\$page_count” assists the page turning. The hyperlink for each article is given by “\$url”.

```

if( $num ){
    if( $num < $pagesize )
        { $page_count = 1; }

    if( $num % $pagesize )
    {
        $page_count = (int)($num / $pagesize) + 1;
    }
    else
    {
        $page_count = $num / $pagesize;
    }
}
else
{
    $page_count = 0;
}

$page_string = '';
if( $page == 1 )
{
    $page_string .= 'First Page|Previous Page|';
}
else
{
    $page_string .= '<a href=".' . $url . '?page=1">First Page</a>|<a href=".' . $url . '?page=' . ($page-1) . '>Previous Page</a>|';
}
if( ($page == $page_count) || ($page_count == 0) )
{
    $page_string .= 'Next Page|Last Page|';
}
else
{
    $page_string .= '<a href=".' . $url . '?page=' . ($page+1) . '>Next Page</a>|<a href=".' . $url . '?page=' . $page_count . '>Last Page</a>|';
}
}

```

Figure 26. Page dividing 1

At last, I used “while-loop” to fetch out the data from the database. The rows of data are limited by “\$pagesize”.

```
<?php
    echo "Total(".$num.")messages" ;
    echo "<br>";
    echo $page_string;

    $sql="SELECT * FROM `article` LIMIT ". ($page-1)*$pagesize ." , $pagesize";

    $query=mysql_query($sql);
    while($row=mysql_fetch_array($query)){

    echo "<hr><b><a href= article_show.php?A_title=$row[0]> >". $row['A_title']."</a>|". $row['A_author'];
    }
}
```

Figure 27. Page dividing 2

5.2.5 Articles

Articles are listed by paging dividing function. On the title list, different articles are shown by clicking their title. I fetched out the articles from the database where ‘A_title’=’\$A_title’, which is shown in figure 28.

```
require_once('db/connect.php');
$A_title=$_REQUEST["A_title"];
$sql = "SELECT * FROM `article` WHERE `A_title`=' $A_title'";
$result = mysql_query($sql);
$row = mysql_fetch_row($result);
```

Figure 28. Article s show

In the database, there is no any format for articles. I fixed it by simply using FCKeditor. FCKeditor transferred the articles’ format into HTML code. Therefore, the articles could have been formatted by using this kind of storing data.

5.2.6 Message board

For the communication between users, I designed the function of the message board. The message board can be divided into two areas: a list of the messages and the writing text area. There are five messages shown in one page. To achieve this, I fetched out all the messages from the database, and echo them by cooperating with page dividing function. Figure 29 showed the layout of message list.

Total(23)messages	
First Page Previous Page Next Page Last Page	
Title: HAHAAH Username: lx95359293 Time:2011-11-10	Content: YOU ARE HERE
Title: lucky~~ Username: lx95359293 Time:2011-11-04	Content: lucky~~lucky~~ lucky~~lucky~~lucky~~ lucky~~lucky~~lucky~~lucky~~
Title: nbbsbb Username: lx95359293 Time:2011-11-01	Content: asdasdasd asdasdasdasd asdasdasdasdasd
Title: nbbsbb Username: lx95359293 Time:2011-11-01	Content: asdasdasd asdasdasdasd asdasdasdasdasd
Title: nbbsbb Username: lx95359293 Time:2011-11-01	Content: asdasdasd asdasdasdasd asdasdasdasdasd

Figure 29. Message list

The users could input their comments in writing text area. Users need to login firstly to leave messages. Furthermore, as it is illustrated in Figure 30, message title could not be empty, and it must contain at least five words. The contents of a message also cannot be empty. Function “htmlinput” is capable of modifying format of message into proper one.

```

function htmlentities($content) {
    $content = str_replace("\n", "<br>", str_replace(" ", "&nbsp;", $content));
    return $content;
}

?>

<SCRIPT language=javascript>
function CheckPost()
{
    if (myform.title.value.length<5)
    {
        alert("at least 5 words on title");
        myform.title.focus();
        return false;
    }
    if (myform.content.value=="")
    {
        alert("you must leave something");
        myform.content.focus();
        return false;
    }
}
</script>
<form action="messageboard.php" method="post" name="myform" onsubmit="return CheckPost();">
    User:<?php echo $_SESSION['U_id'];?><br>
    MessageTitle:
    <input type="text" name="title"><br/>
    Content:
    <textarea name="content"></textarea><br>

    <input type="submit" name="submit" value="OK!" />

</form>
</div>

```

Figure 30. Writing text area

Users could only delete their own messages. Administrator could delete any messages in the database. Figure 31 points out that Delete.php achieved this function.

```

<?php
include ("db/connect.php");
$user=$_GET['user'];

$sql = "DELETE FROM message WHERE user ='$user'";
$conn = mysql_connect ($mysql_server_name, $mysql_username, $mysql_password);
mysql_select_db ($mysql_database, $conn);
$result = mysql_query ($sql);
mysql_close ($conn);
?>
<html>
<a href="messageboard.php">Return</a>
</html>

```

Figure 31. Delete.php

5.2.7 Visitor counter

This function is used to count the total number of visitors. In figure 32, the workflow of the function could be divided into three steps: at first, there was one row of data to be inserted into the database when a visitor logged in. I achieved this by cookie function. Secondly, I needed to analyze IP for each visitor. At last, I set time limitation for various IP addresses. Through this idea, I could easily avoid the spamming.

```

<?php
require_once('db/connect.php');
if(!empty($_POST['counter']))
setcookie('counter',$counter,0);
//setcookie('cookiesame', value, saving time as seconds,
$ip=getenv('REMOTE_ADDR');//get ip function
if(isset($_COOKIE['counter']))(
    // $counter=$_COOKIE['counter']; //this adds value to the counter
    //cookie exists, do not save any values into database
}
else {
//select
$sqls="SELECT * FROM 'vcounter' WHERE ip = '$ip'";
$results=mysql_query($sqls);
$rows=mysql_fetch_row($results);

if(!$rows) //if no ip in database
{
    $sql="INSERT INTO 'ibec'. 'vcounter' ('VN', 'ip', 'time_at') VALUES ('1', '$ip', NOW())";
    $result=mysql_query($sql);
}
else{
    $sqls="SELECT TIME_TO_SEC( NOW( ) ) - TIME_TO_SEC( time_at ) FROM 'vcounter' WHERE ip = '$ip' ORDER BY TIME_TO_SEC( NOW( ) ) - TIME_TO_SEC( time_at ) A
    //account time in sec function from ip=ip
    $results=mysql_query($sqls);
    $rows=mysql_fetch_row($results);

    if($rows[0]> 40)//set 40 sec
    {
        $sql="INSERT INTO 'ibec'. 'vcounter' ('VN', 'ip', 'time_at') VALUES ('1', '$ip', NOW())";
        $result=mysql_query($sql);
    }
}
}

```

Figure 32. Visitor counter

Furthermore, visitor.php has been included in the foot area of homepage. It only counts the number of users who open cookie functions of web browsers

5.2.8 Searching

After the index.php page gets the value of submit, the contents of user's input would be transmitted to search.php by an instruction code of "table action=search.php". After search.php receives the value, the searching function starts. I achieved searching

function by executing a MySQL sentence of "SELECT * FROM `article` where A_title like '%\$_GET[key]%'". “\$_GET[Key]” is the value which has been translated from index.php. And ‘%’ means searching the key words from both prefix and suffix. The more details are shown in Figure 33.

```

    <?php
    if($_GET[key]){
    $sqls="SELECT * FROM `article` where A_title like '%$_GET[key]%'";

    $q=mysql_query($sqls);

    while($r=mysql_fetch_array($q)){
    echo "<a href=article_show.php?A_title=$r[0]>".$r['A_title']."</a><br>";
    }
    }
    ?>

```

Figure 33. Searching

5.3 The usability testing

After the functions operated successful, I was prepared the usability test for the website. There are two major considerations when conducting usability testing. The first is to ensure that the best possible method for testing is used. Generally, the best method is to conduct a test where representative participants interact with representative scenarios. The second is the more the website was tested, the better it operated. (Leavitt & Shneiderman 2007, 188.)

In the whole workflow of my thesis work, only my supervisor could be regarded as a participant. It was not enough for the test. Fortunately, I found a problem in this situation. For instance, on the homepage, there is no sub catalog for users. The users could not directly view the latest news at homepage. I solved this problem at the last by using Iframe function. Absolutely, there are other problems in usability part. This

instance pointed out that I still need to collect more opinions from others in the future. In conclusion, to be honest, due to the limitation of time, I did not fully complete the usability part of the website.

6 CONCLUSIONS

The aim of my study is to learn to build a successful website for the college called International Business Economic College of Wuhan Textile University. Because of limitation of time, I only designed the functions and basic layout for the college without adding any contents. My work phases could be dividing into four parts. Part one is to collect information about designing a website. Part two is to choose a methodology and some software. Part three is to prepare with UML. Finally, I designed the website's layout and functions.

Moreover, by doing this work assigned by IBEC, I acquired experience to utilize PHP, HTML, CSS, and JavaScript basic on WAMP server in a real-life context. And also I got experience of using constructive method. Therefore, I obtained knowledge about website establishment by this thesis research. The website includes the functions of login, registration, session, message board, article show, visitor counting, and searching. Finally, I successfully developed those eight functions and the basic layout of the website.

6.1 Challenges I met

The most difficult and significant part of my website is the message board function. Because all the messages from users are often in chaos and mess, I need to use the dividing page function for it. However, the old page dividing function of article cannot work with message board function. Therefore, I spent a lot of time to fix and optimize it. Furthermore, when I had inputted some messages on the message board, the output form was different from what I had inputted. Finally, I solved this problem with the help of the supervisor.

Another problem I met concerns the WAMP version. The WAMP version on my computer was old. When I tried to use the new version of WAMP, the PHP version

was also enhanced by this update. As a result, there is a large number of alerting messages which I did not meet before. I had to fix it one by one.

6.2 Future development

Even if the functions of the website are finished, it still needs further development on the aspects of usability and security. In my opinion, the most significant part in the future work is to study how this IBEC website could be compatible with the IBEC's content management system. Therefore, I will contact with the college to fix problems about usability of the website.

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APPENDIX

Appendix 1. Contract

Entrustment Agreement

To further promote the popularity of our college all over the world, strengthen the contacts with foreign universities and search for more channels of developing the college, the College Board agreed to entrust Mr. Liu Xin to design and establish an English website for us.

The website should be of characters as follows: simple operation, stable performance, fresh layout, and comprehensive Contents. The charges of producing the website should be decided by both sides later.

Entrustment Entity: International Business and Economic College, Wuhan Textile University

Address: Textile Road No.1, Hongshan District, Wuhan City, Hubei Province, China

Telephone: 86-27-50653178