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Creating Dynamic Website of Anhui Fuyang Lingxin Network
Technology Corporation Limited

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ABSTRACT

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The aim of this research is to create a dynamic website, and the website should provide a remote practical training environment for case company. The research will investigate how dynamic website can be created. Further, the research will explore the suitable tools and techniques used to create a dynamic website. The research also aims to create some essential functions which can provide the platform to trainees to do their practical training remotely.

The methodology of this research is divided into two parts. In first part, constructive method was selected as research methodology. The second part is mainly focus on proper tools and techniques used to create dynamic website, the brief discussion of tools selection will included as well.

The expected output of this research is the creation of dynamic website. Besides, the website contains essential functions such as login system, message board, file upload and online registration. Those function are dedicates to provide remote environment for trainees.

Keywords: HTML, CSS, MYSQL, PHP, Dynamic Website Creation, WAMP

ABBREVIATIONS

FYLX	Fuyang Lingxin network technology Co. Ltd.
CMCC	China Mobile Communication Corporation
KTUAS	Kemi-Tornio University of Applied Sciences
HTML	Hypertext markup language
CSS	Cascading style sheets
PHP	Hypertext Preprocessor
WAMP	Combination of Windows, Apache, MySQL, and PHP. One of the website develops environments.
UML	Unified Modeling Language
IIS	Internet Information Server

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ABBREVIATIONS

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1 INTRODUCTION AND MOTIVATION

1.1 Background Information and Motivation

In order to complete the bachelor thesis, the emails about thesis work request were sent to Chinese companies in 2011. Due to the personal interests and the case which mostly relates to my study field, the company named Fuyang Lingxin Network Technology Co. Ltd (FYLX) was selected as my case company. The owner of FYLX assigned me to create a dynamic website which can be used as remote practical training environment. The most important part of dynamic website creation is to achieve the principle of “dynamic”. Compare with static website, the content of dynamic web page can be changed with users’ action. Further, there are many website development environments can be used, such as “Windows, Apache, Mysql, and PHP (WAMP)”, “Linux, Apache, Mysql, and PHP (LAMP), and “Windows, IIS, Mysql and Apache (WIMA)”. Those development environments are similar from technology point of view. For instance, the operating system Windows or Linux is the basic platform, Apache and IIS are both used as web server.

As FYLX required, the dynamic website should enable trainees to start their training ship remotely. Consequently, the objectives of this research were defined, creating a dynamic website which enables trainees to start their practical training online. Specifically, the functions in the dynamic website should meet the trainees’ essential requirements. For example, the trainees would get their tasks and upload their answers both online. Besides, the interaction between supervisors and trainees need to be achieved as well. As the result, there are some functions were particularly focused as follows: (1) login system, (2) file uploading (3) message board.

In this research, the design of dynamic website was systematically planned. Firstly, the suitable development environment was selected. After that, the outlook of website

was created through class diagram and DIV tags. Lastly the functions were inserted according to use case diagrams and activity diagrams.

1.2 Thesis Structure

The entire thesis is divided into six chapters. Chapter 1 contains information about my case company and personal motivation. Chapter 2 deals with three main research questions. Chapter 3 includes the methodology of my thesis and the implementation method of website creation. Chapter 4 focus on UML modeling and basic class diagram for whole website, and the UML use case for different functions of website. Chapter 5 describes the basic user interface design and the explanation of the main syntax that how the functions were acquired. Chapter 6 is the conclusion of my thesis work.

2 RESEARCH QUESTIONS

The final aim of this research is to create a dynamic website for FYLX trainees. The website is used by trainees of FYLX and the problem of resource limitation should be solved through this website. More specifically, the research focuses on how the opportunity to use the website can offer a remote environment for trainees. Secondly, the basic structure and functionalities the websites need to include. Lastly, the research selects a suitable implementation environment and implements the website through UML diagrams. The following questions are the main research questions in this research with the objective to complete the website creation.

What are main functions this website needs?

Since the trainees are involved as college and university students in FYLX, there are some of the trainees are international students. As a result, English content or version is required. Besides, the website is used to offer a remote environment for trainees to complete their practical training tasks. Thus the basic function of website should contain the following functions: login system for identifying the trainees, tasks information, uploading files where the trainees can upload their answers of the tasks, and an interaction function between the trainees and the supervisor as well. Moreover, as general, the website should contain the basic information or news of the company as well. Through the answers to this question, the functions of the website can be specified and designed.

What kind of development environment is suitable to this website?

As I discussed in the previous chapter, there are many combinations of development environment for creating a website. Generally, those development environments consist of Windows/Linux/Mac, Apache/IIS, MySQL and PHP/ASP. Through the

comparison between the different tools, the most suitable implementation environment can be selected as the final development environment. The comparison involves capability, personal habit, and financial points of view.

How can the usability of this website be designed?

“Usability is the measure of the quality of a user's experience when interacting with a product or system, whether a web site, software application, mobile technology, or any user-operated device” (Britsios 2012). On the basis of the knowledge I was studied from university, the basic UI of the website focuses on the whole website construction arrangement, with a suitable header of web page and proper navigation bar of the website. Besides, the analyse and review of some good UI web pages will be needed as well, of course the materials from UI course will be taken as reference in order to design the initial user-friendly UI of the website.

3 METHODOLOGY

3.1 Research Methodology

The constructive methodology was selected as the research method, because this research is a case study research. Constructive research aims at producing novel solutions to practically and theoretically relevant problems. Widely used in software engineering and computer science, rarely in management and social sciences (Ryabov 2011).

The expected result of constructive research is displayed in Figure1:

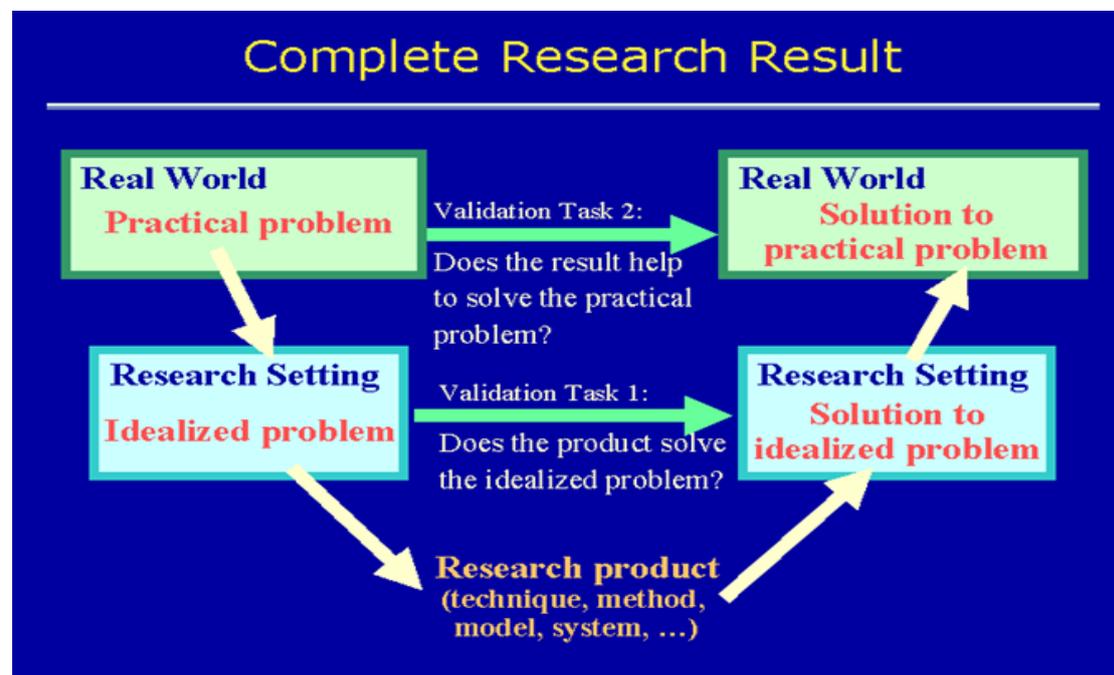


Figure 1: Complete research result (Vanhanen & Soininen & Lassenius 2001)

The complete result of constructive research is categorized as 5 steps. The first part, finds the practical problem in real world, while part 2 focuses on idealized problem as research setting. Part 3 mainly relates to creating a research product, and it can be a kind of technique, or a method. Part 4 gets the solution to idealized problem. Lastly, part 5 comes up with the solution to practical problem. The main point in constructive

research are include two main questions, does the result help solve the practical problem and does the product solve the idealized problem.

In my research, the practical problem is FYLX's trainee arrangement, the idealized problem is the resource limitation, and the research product is a dynamic website where trainees can take practical training online. Then the coming question is: does it works? In my opinion, the answer is: yes. Since I have been studied in Kemi-Tornio University of Applied Sciences as an international student almost 3 years, there are some experience can support my opinion. For example, KTUAS is offering the online course and online degree program for someone who is living far away from school. Besides, some Finnish companies also have their private website for trainees. Consequently, I am feeling confident enough to provide my thesis work as a solution to my case company.

Besides, online interview was selected as my research technique, in order to ensure what kinds of functionalities FYLX needs, what further information or functions trainees prefer. Therefore, an online interview was held between FYLX's owner and me. From the interview, the essential functions of website were defined and it will be introduced in chapter 3.

3.2 Implementation Tools

The following information is the technique tools I was used in order to implement the website.

HTML

“HTML is a computer language devised to allow website creation. The definition of HTML is Hypertext Markup Language.” (Shannon 2010.) HTML files are text files,

but compare with real text file, HTML can include and display more elements, for instance image, super links, sounds, videos. The syntax of HTML is translated by browser, and each part of a single webpage is marked by HTML tags. Through different tags the browser can display the basic outlook of a webpage.

CSS

“CSS is acronym of Cascading Style Sheet. Style sheets are a very powerful tool for the Web site developer. They give the developer the chance to be completely consistent with the look and feel of your pages.” (Knuttel 2004.) Generally, the CSS is the tool which could be used to adjust the position of different HTML tags. It is also the basic way to beautify the content of a website.

DIV+CSS

“The <div> tag defines a division or a section in an HTML document and <div> tag is used to group block-elements to format them with styles” (w3schools.com 2012). Usually the DIV+CSS are used to create navigation in a website, or separate a web page into several parts. As the result, the content and information could be distributed in different parts of a webpage.

PHP

“PHP is a server-side scripting language” (w3schools.com 2012). Generally, the php can be inserted into HTML syntax. Since php is a server-side scripting language, the php code can only be executed in server, which means in order to run php code, a server is required. PHP contains a lot of functions which can insert data to a website database, and retrieval data from a database. It is a main tool to create a dynamic website.

MySQL

“MySQL is a fast and powerful yet easy-to-use database system that offers just about anything a website would need in order to find and serve up data to browser” (Nixon 2009). There is a simple way to identify the difference between static and dynamic website. If a website has a database, then the website is dynamic, because the content of website is changing with the users’ action, and this changing is basic on the database.

JAVASCRIPT

“JavaScript was created to enable scripting access to all the elements of an HTML document. Combined with CSS, JavaScript is the power behind dynamic web pages that change in front of your eyes rather than when a new page is returned by the server.” (Nixon 2009.)

WAMP

WAMP is a one of implementation environments which used to create a website. It is the abbreviation for Windows, Apache, MySQL and PHP. There are some other implementation environments such as MAMP, LAMP and WIMA, and they are abbreviations for Mac, Apache, MySQL, and PHP, Linux, Apache, MySQL and PHP, Windows, IIS, MySQL and ASP.net. “These abbreviations describe a fully functioning setup used for developing dynamic Internet web pages.” (Nixon 2009) There are some reasons why I was selected WAMP as my implementation environment. Firstly, Apache is free of charge to download from Internet, while IIS is embedded with Microsoft Windows operating system, if one wants to use IIS, an official operation system installing CD needs to be bought from stores. Secondly, two different powerful tools are needed to implement dynamic website, in order to run ASP programs, IIS needs to be installed on a Windows platform server, as I

mentioned previously, IIS is not free, and PHP code is running faster than ASP. Besides, php is really flexible to connect various databases, but ASP is mainly use MS-SQL (Halstatt 2005.)

UML

“The Unified Modelling Language (UML) is a standard widely adopted graphical language that describes the artifacts of software systems with a focus on conceptual and physical representations” (Synergy Learning & Gentleware 2006). In this research, the UML is used to design the basic structure of my website and all the functionalities of websites are classified through UML use case diagram. As the consequence, the website can be completed step by step and systematically draw up how the website has been designed.

NOTEPAD++

“NOTEPAD++ is an application which could be used to edit code and syntax. It is like many other coding environments, can recognize multiple languages, and it organizes your code into the proper form while highlighting the functions, variables, and such with different colors.” (Webmasterformat 2012.) In my research, all syntax and coding of PHP, CSS, HTML is all edited by NOTPPAD++.

APPSERV

“AppServ is a full-featured of Apache, MySQL, PHP, phpMyAdmin” (Appservnetwork 2006). It is an integrated environment for website implementation. The advantage of using integrate environment is that all the needed software could be installed once, even though the integrated environment may could not update new version of each Software. However, the integrated environment have systematical configuration setup, if a web developer need more configuration, the configuration

files could be edited by Notepad++.

4 UML MODELING OF THE SYSTEM

4.1 The Feature of Website

Before designing the basic structure, there is one important but essential question to be explained. This question is how to achieve “dynamic” as a main feature of the website, the Figure 2 illustrates how the dynamic website works.

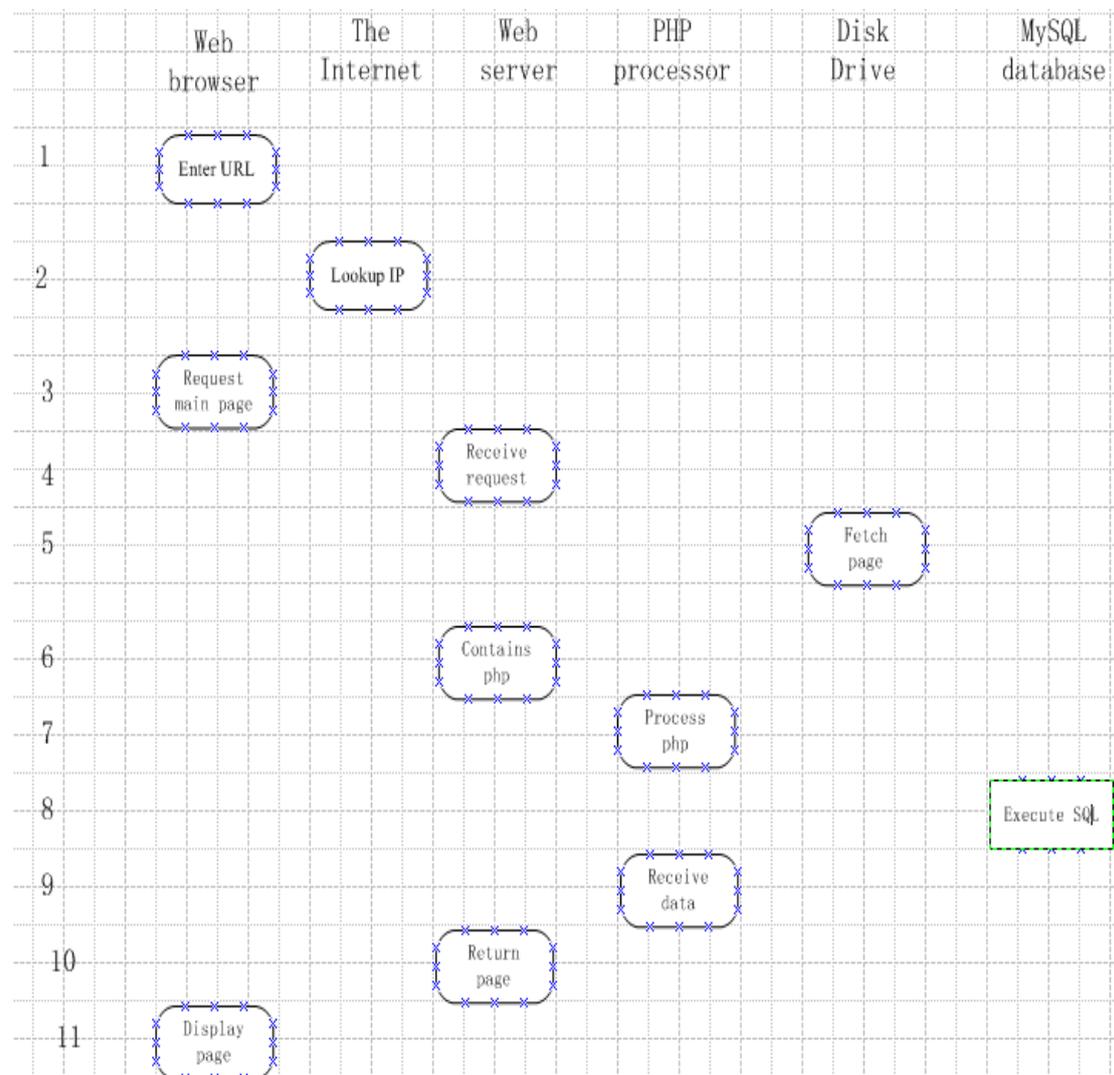


Figure 2. A dynamic client/server request/response sequence (Robin 2009)

In the figure above, the “dynamic” sequence is divided into 11 steps. Once the user has entered the URL of a website, the Internet will look up the IP of entered URL. After that, browser request the main page to web server, and web server received the request and fetch the requested page in disk drive. As I mentioned in chapter 2, PHP is located in web server, since PHP processor is a part of web server’s configuration, then if the webpage contains PHP code, it will be processed in web server, at the end, MySQL execute SQL language and return it to PHP processor, and the requested page will be displayed in browser. (Robin 2009.)

If the practical part of this research is dynamic website creation, the functions design will be created on the bases of user requests and the sequence of dynamic website.

4.2 Basic Structure of Website

Since the basic idea of the website has been explained previously in Figure 2, the next step is to draw up the basic outlook of the entire website, because the process of my implementation plan includes the following stages: (1) characterize the feature of website, (2) design the essential outlook of website, (3) draw up the class diagram, user case diagram and activity diagram for website and functions, (4) coding and testing in different browsers. Latulippe (2009 11) suggests that “unless the web developer is a major brand, then s/he should not try to deviate from the norms of design. Besides, the website needs to be tested in different browsers after implementation completed.” Figure 3 is shows the outlook of the main page, Figure 4 is the essential out look of message board, and Figure 5 is the layout of registration page.

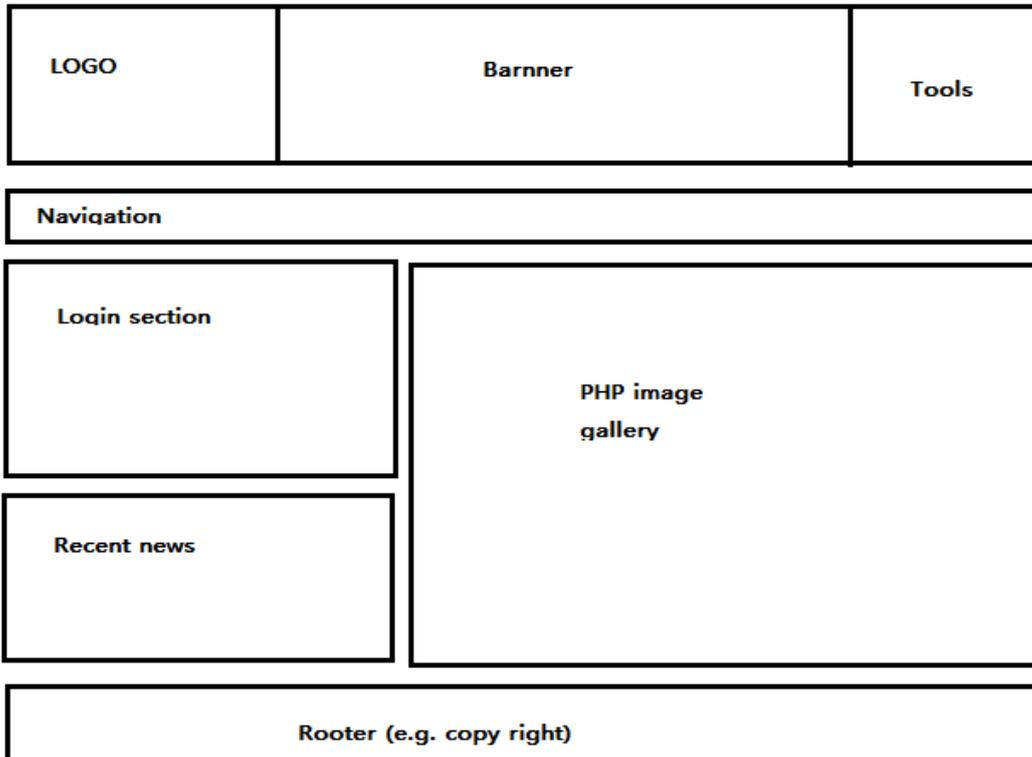


Figure 3. DIV structure of homepage

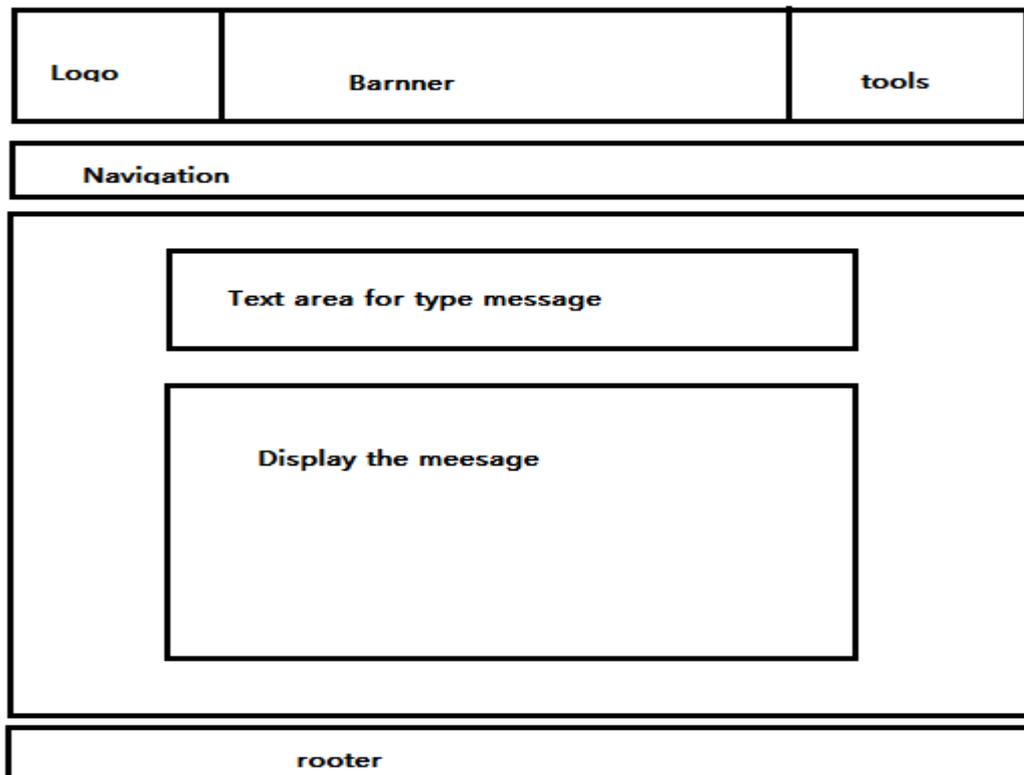
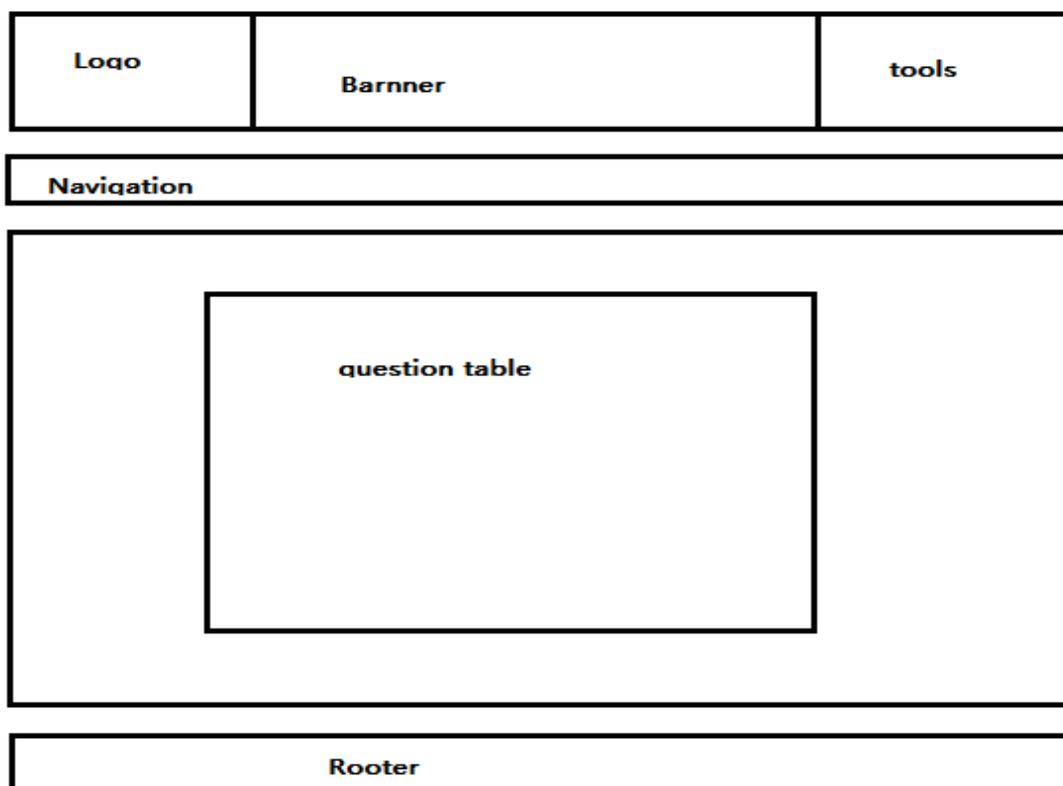


Figure 4. DIV structure of Message board function**Figure 5.** The DIV structure of registration page

Those three figures have illustrate how the basic DIV box distributes, the tools part displayed above provide the log out function for users. Each DIV box has its unique class name, because the PHP code is inserted, especially the log in section. The typed information will be passed to database and fetch the database whether the username and password are correct or not.

4.3 UML Modeling

4.3.1 Class Diagram of the Website

After the fundamental DIV outlooks have been created, the step to follow is to draw up the class diagram of entire website. Combine with the users' requests and the dynamic website defined in Figure 2, the functions of the website was settled as follows: Login system, message board, online registration, and file handling (upload files). The purpose of the class diagram is to show the static structure of the system being modeled. The diagram specifically shows the entities in the system (Bell 2003). The class diagram below shows the relationship between different functions and database.

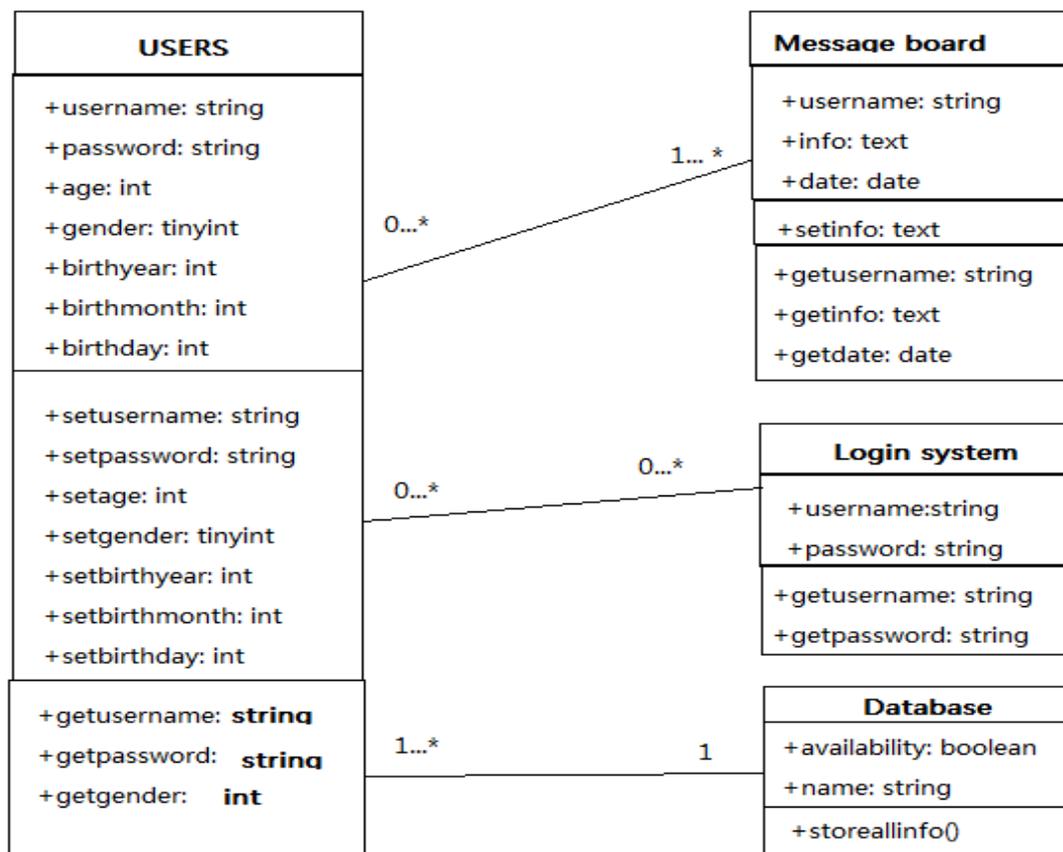
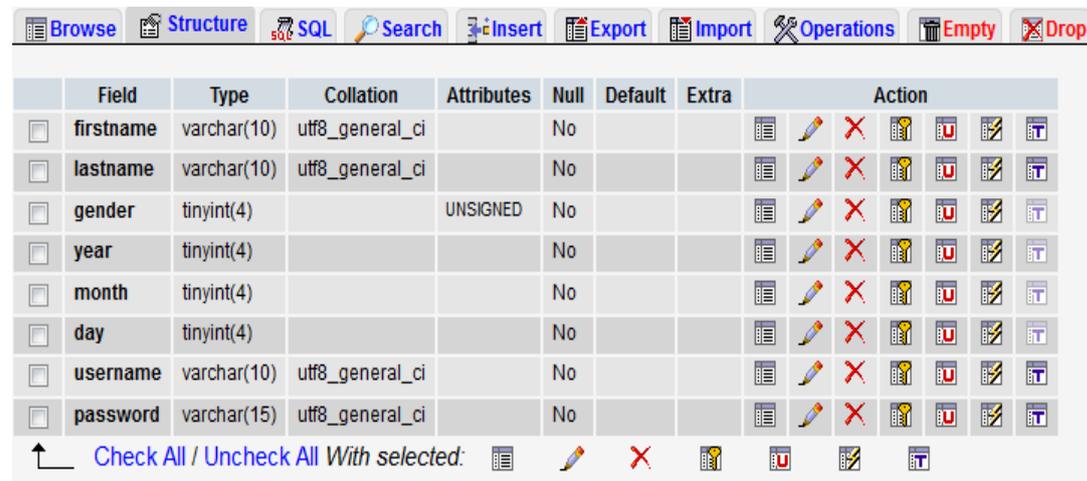


Figure 6. Class diagram of the website

Meloni (2003 261) argues that a good database design is crucial for a high performance application and the database should be easy to maintain. As a

consequence, MySQL database was selected as a tool to create website database and according to the class diagram above, the database of the website could be designed easily as following in three main tables: (1) register (2) message (3) files. The register table contains all users' information, in order to save the space of the database, the login system was created on the bases of register table instead of a repeated and separated table in the database.

The register table in figure 7 has 8 fields. The field firstname and lastname are pointed in the real name of the users. Besides, the username is the information where user can use them to logging into the system.



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	firstname	varchar(10)	utf8_general_ci		No			[Icons]
<input type="checkbox"/>	lastname	varchar(10)	utf8_general_ci		No			[Icons]
<input type="checkbox"/>	gender	tinyint(4)		UNSIGNED	No			[Icons]
<input type="checkbox"/>	year	tinyint(4)			No			[Icons]
<input type="checkbox"/>	month	tinyint(4)			No			[Icons]
<input type="checkbox"/>	day	tinyint(4)			No			[Icons]
<input type="checkbox"/>	username	varchar(10)	utf8_general_ci		No			[Icons]
<input type="checkbox"/>	password	varchar(15)	utf8_general_ci		No			[Icons]

↑ Check All / Uncheck All With selected: [Icons]

Figure 7. Register table in database

The message table in figure 8 is a table where the inputted information or text will be saved and 3 fields as follows: time, info and username. The time field is used to store the time of operating system when user published the message, the data could be collected by PHP. Field 2 is the place where the inputted message will be stored, and field 3 stored the username after the user has been logged in. For instance, the message board requires displaying the username of the message publisher, but login system could only identify whether the username and password are correct or not. In case to keep the user information and marked them, the PHP SESSION function was

used to store the user information and used in other applications.

The screenshot shows a database management interface with the following details:

- Server: localhost
- Database: demo
- Table: message
- Navigation buttons: Browse, Structure, SQL, Search, Insert, Export, Import, Operations, Empty, Drop

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	time	datetime			No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]
<input type="checkbox"/>	info	text	utf8_general_ci		No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]
<input type="checkbox"/>	username	varchar(15)	utf8_general_ci		No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]

Check All / Uncheck All With selected: [List] [Edit] [Delete] [Refresh] [U] [D] [T]

Figure 8. Message table in database

The last files figure 9 is a table where users can upload and store their answers of given tasks, for example, Microsoft word file. The figure contains 3 fields, and they are distributing as (1) filename (2) time (3) username. The filename field is used to store the name of the uploaded file, and time filed is the time of operating system when the user is uploading files. The last field username is as same as it in message table, the place where can saved the user information.

The screenshot shows a database management interface with the following details:

- Server: localhost
- Database: demo
- Table: files
- Navigation buttons: Browse, Structure, SQL, Search, Insert, Export, Import, Operations, Empty, Drop

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	filename	varchar(15)	utf8_general_ci		No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]
<input type="checkbox"/>	time	datetime			No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]
<input type="checkbox"/>	username	varchar(15)	utf8_general_ci		No			[List] [Edit] [Delete] [Refresh] [U] [D] [T]

Check All / Uncheck All With selected: [List] [Edit] [Delete] [Refresh] [U] [D] [T]

Figure 9. Files table in database

4.3.2 UML Use Case

“A use case illustrates a unit of functionality provided by the system. The main purpose of the use-case diagram is to help development teams visualize the functional

requirements of a system, including the relationship of actors (human beings who will interact with the system) to essential processes, as well as the relationships among different use cases.” (Bell 2003.)

Also Gorman (2006 13) explained that the use case should be clarified through following basic steps. Firstly, identify the actors: who will be using system. Secondly, identify their goals: what will they be using the system to do. Lastly, identify key scenarios: in trying to achieve a specific goal, what distinct outcomes or workflows might we need to consider? According to the steps above, there are two kinds of actors was defined in the website. The first type of actors is registered users, and the second type of actor is visitors. The main difference between those two kinds of actor is the authority in the website. For instance, the registered users can leave message in the website, scan the entire website, visitors can only scan the general information display in web page, but they could register themselves in the online register page. The figure 10 shows the different between those two actors.

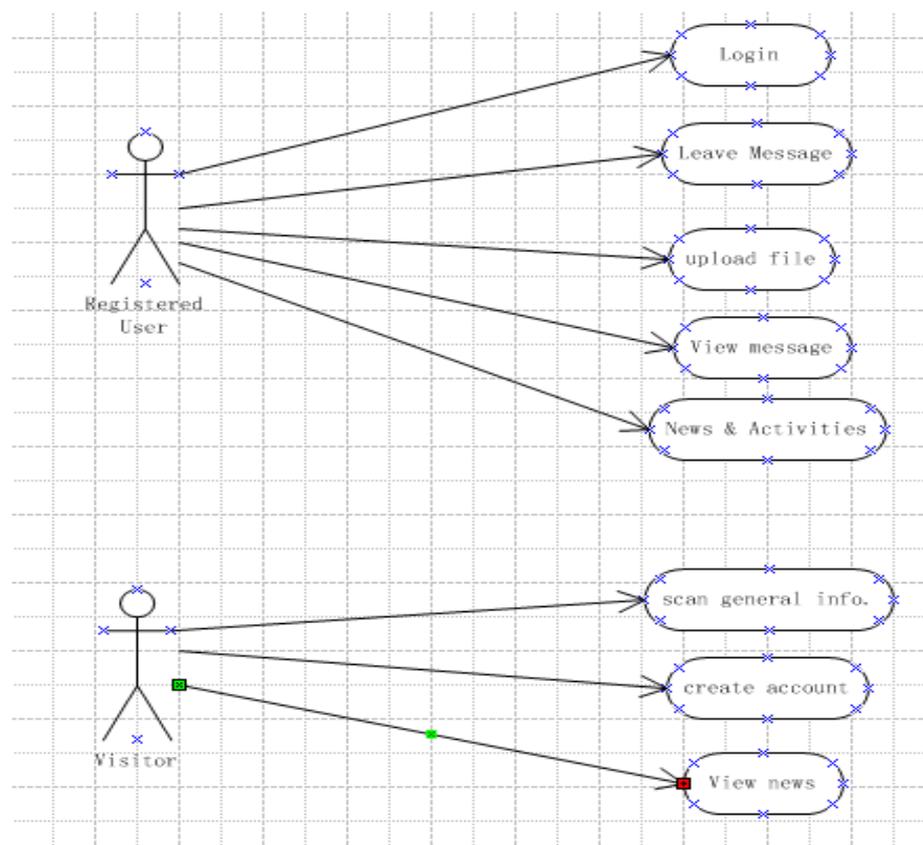


Figure 10. Use case diagram of website

4.3.3 Activity Diagram of Functions

In its basic form, an activity diagram is a simple and intuitive illustration of what happens in a workflow, what activities can be done in parallel, and whether there are alternative paths through the workflow (Ericsson 2012). In figure 11, an activity diagram will displayed the workflow of logging in system.

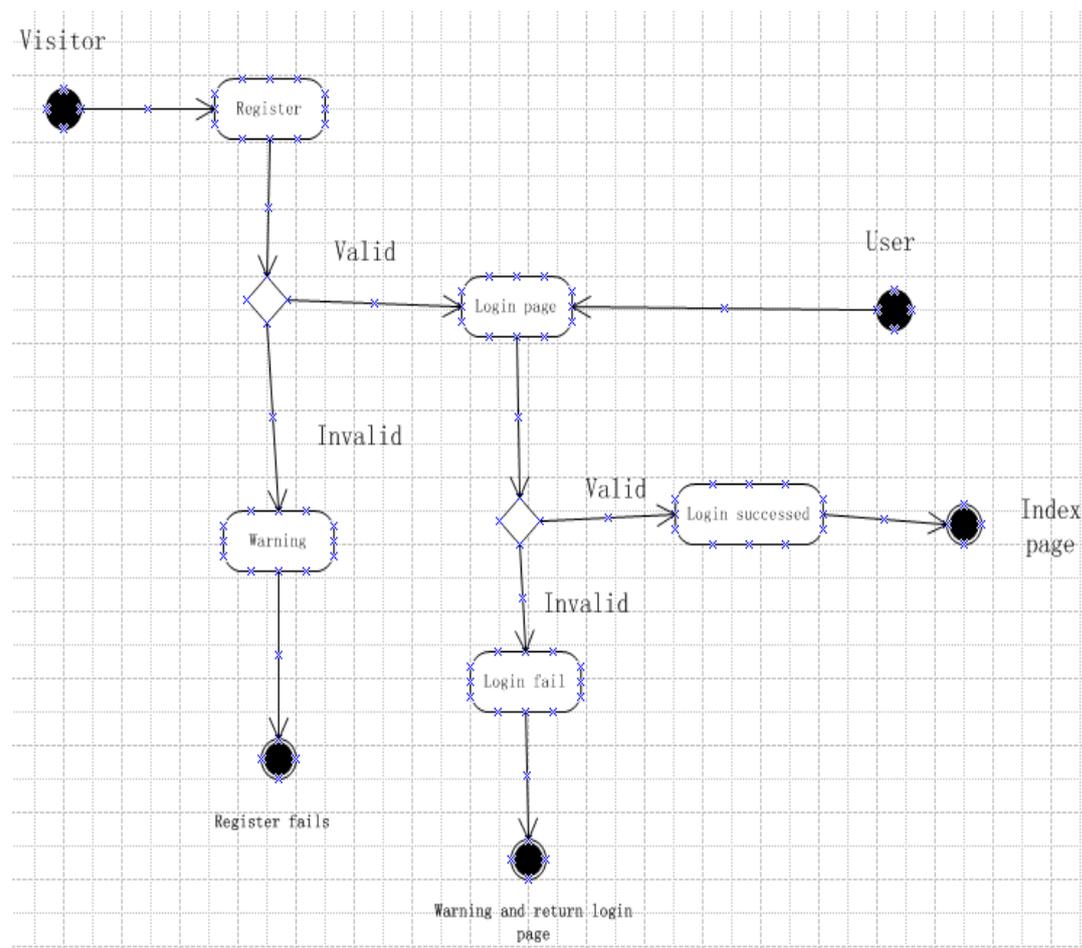


Figure 11. Activity diagram of login system

In the figure above, two actors have been involved, when registered user is trying to enter username and password in login page, the PHP code will execute in order to

fetch the database that whether the username and password both valid or not. If it is valid data, the web page will be redirected from login page to index home page, otherwise the system will give warning and then again redirect to login page. Beside, the visitor does not have account, thus they need to register themselves through online registration. It is the same principle that PHP can check whether the given data valid or not. If it is valid, the page will redirect to login page, then visitor became to be a user of the website, otherwise system give the warning and registration fails.

The figure 12 describes the message board activity diagram as follows, the registered users have the authority to leave message and delete the users' own message.

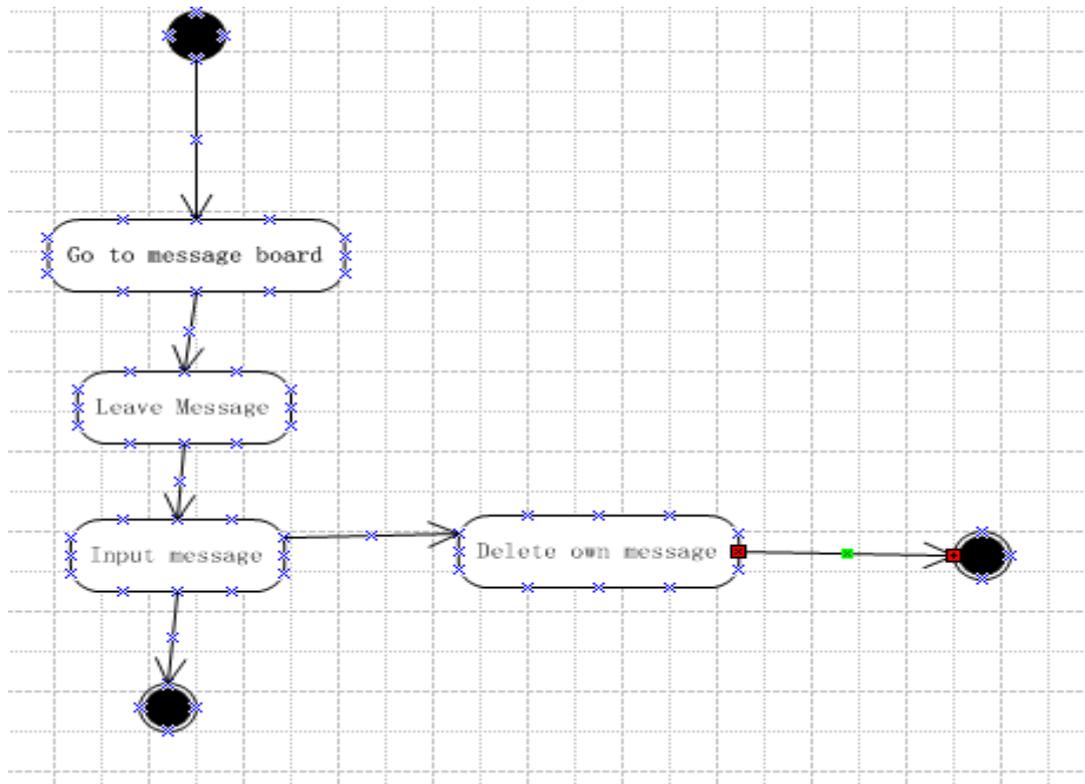


Figure 12. Activity diagram of message board

4.3.4 Website Structure Modeling

The final step before the coding part is the structure modeling of entire website, a

website is consist of several web pages, the figure 13 below shows the constructive plan of each web page.

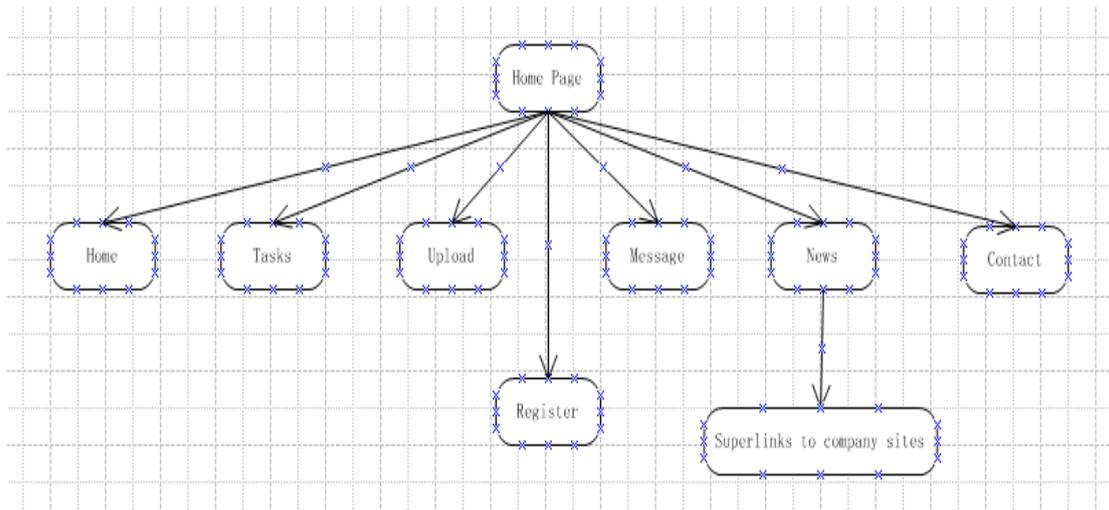


Figure 13. Web structure modeling

In the home page, the entire pages were divided as five main parts by DIV tags and CSS, and they are div (container), div (header), div (main), div (footer), div (navigation). More specifically, the div (header) was divided as three parts, for instance company logo, banner of the website, tools like logout etc. The div (main) were categorized as three parts, first part is div (log) where user can input their user data, and also the register super link is settled inside of div (log). Second part is div (news), where the current news of company will be listed. The last part is the place where image-text activities will be displayed. The div (navigation) was created to link five main pages except home page itself. In navigation, firstly it links to file task.php where trainees could get their tasks. Secondly it links to upload.php where trainees can upload their files. Thirdly it links to meesage.php where user could leave messages. Last it links to news.php and contact.php where user could get the recent happenings in company and contact information of company.

5 FUNCTIONALITIES IMPLEMENTATION

5.1 User Interface

A good website not only includes various types of functions. The usability of a website is also important, especially the home page of a website, because users or visitors can all get the first expression that how the website looks like. Jakob (2012 1) advises that the usability design should be designed on the bases of the listed points:

“1. Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design?

2. Efficiency: Once users have learned the design, how quickly can they perform tasks?

3. Memorability: When users return to the design after a period of not using it, how easily can they reestablish proficiency?

4. Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?

5. Satisfaction: How pleasant is it to use the design?”

Beside, there are also five elements to be considered during the implementation. Firstly, the website home page, since the user will get first expression. Therefore, the home page should be clearly display the purpose of the website. Secondly, the page layout is important as well. For example, the content of website should be visible without scrolling. Thirdly, the navigation should exist in all pages and the scheme of navigation should be same. Lastly, the website color, developer should prevent the use of glaring colors, because glaring colors can distract users' attention. (Zalas 2012.)

Moreover, Magdalena pointed out that green color stands for nature, life, hope, and balance. Consequently, the website layouts were designed as general in order to

provide a better Learnability. The home page was simply present essential information to the users and visitors, all the functions are mainly listed in the navigation bar. Besides, the website was used fluid green color in order to present a fresh layout, the contents of home page contain proper amount of information only, Figure 14 illustrates the layout of the website I was created:



Figure 14. Home page layout

The given PHP gallery image-text news are examples. The news lists below the login dialog are examples as well. The company is able to change them and display the news what they wanted.

Figure 15 is the layout of registration page.

The image shows a registration page layout. At the top left is the logo for 'fylingxin.com' with the text '领信科技' and 'www.fylingxin.com'. To the right is a banner with the text '专注高品质网站' and '帮助民族品牌走向世界 做受尊重企业'. Below the banner is a navigation menu with links: Home, Tasks, Upload, Message, News, and Contact. The main content area contains a registration form with the following fields: Username (text input), Password (text input), Gender (radio buttons for Male and Female), Birthday (three dropdown menus for Year, Month, and Day), and a Submit button.

Figure 15. Layout of register page

The forms displayed in figure 15 are the examples of layout of online register page. There is one thing need to be explained, the same principle of data was eliminated. For example, the username has the same data principle with firstname. Therefore, the username input field was created only, instead of create both username and firstname input field.

Figure 16 is the layout of message board in website. Zalas (2012 19) advised that the most important information need to be settled in the position of top center of a web

page. As the result, the input text area was created in the top center of the web page.



Figure 16. Layout of message board

In all, the layout was created without the CSS free open source templates, because the open sources were designed in different situation. For instance, the open source may design a layout with several specific or unique div tags. In order to beautify the layout, the div tags were named by different classes or ids. If someone wants to use the open source, then the user should find out how the div tags were distinguished by classes or ids. After that, the CSS code needs to be reviewed in order to change it as appropriate source in the given case. The personal behavior also affects the code reading due to the fact that programmers may write code in a different way. Sometimes even it takes more time to edit code in open source compare with writing syntax by developer himself.

5.2 Coding of Functions

With the layouts of the entire website created, the last step is design the functional code and inserting it to basic structure syntax. After the conversation with my supervisor, the functions of the website have been designed. The essential functions are created as login system, logout function, online register, and file uploading. The other functions are to an extent more complicated than the functions mentioned above. The other functions are message board, page division of message, and phpimagegallery.

5.2.1 Login System

The login system was applied in the home page. There are two columns where user could input there username and password. The submit button is located under the columns. The online register is settled in the same div box in case the visitors want to be registered as a user. The login system include html input dialog and submit button, user identification, JavaScript warning if the username and password are incorrect. In figure 17, the login dialog and the layout of the home page after login are presented.



Figure 17. The layout of web page before login and after login

In this login system, the variables username and password were created and used. After login, the web page can present the username of the user who was successfully logged into the system, because the php session function was deigned in order to store the user information. Other pages may need those data, for example, present the username that who has been leave the message in message board. Further details will be introduced in chapter 5.2.2.

In order to achieve the user identification function, there is a php file has been created as userlog.php, when a user clicks the submit button in home page, the username and password are sent to userlog.php. The coding of userlog.php is displayed in Figure 18.

```

<?php
    $mysql_server_name="localhost";
    $mysql_username="root";
    $mysql_password="1234";
    $mysql_database="demo";
    $con=mysql_connect($mysql_servername, $mysql_username, $mysql_password);//connect to database
    mysql_select_db($mysql_database, $con);
    $sql="SELECT * FROM register WHERE username='$username' and password='$password'";
    $result=mysql_query($sql, $con) or die ('Can not execute the query to the database');
    if($row=mysql_fetch_array($result)){
        //if user is found in database, add information to the session variables to be used in application
        session_start();
        $_SESSION['user']=$row['username'];
        mysql_free_result($result);
        mysql_close($con);
        header('location:loginindex.php');// back to homepage if successful login
    }
    else{
        //incorrect username or password, back to login
        mysql_close($con);
        echo "<script> alert ('wrong username or password!');location.href='home.php'</script> ";
    }
?>

```

Figure 18. Syntax of userlog.php

As figure 18 is presented, after the data of username and password were sent to userlog.php, the userlog.php will connect to the database. Following this, the SQL

will execute from table register. The SQL coding will fetch every stored data, where the username and password are both same and corresponding with the data user was inputted. After that, if else function will executes. If the username and password are both valid, the login page will be redirected to home page. It needs to be pointed out that the home page after login is different with the home page before login. Moreover, if the username and password are not valid, the page will provide a warning dialog which is designed by JavaScript. It will inform the user that username or password is wrong through a php alert. In that case, the page will be redirected to the home page before successfully logged in.

5.2.2 PHP SESSION and Logout Function

Once the user has successfully logged into the system, a major problem needs to be considered. For instance the user cannot keep on logging. If this takes place, even though the user has closed browser, the user's information is still stored in php \$_SESSION []. It is not secure in web security aspect. Considered with the authority of different user group, there should be a function available for distinguish users. Figure 19 shows the coding of php session function which will assist the website with recognizing the users.

```
if($row=mysql_fetch_array($result)){
    //if user is found in database, add information to the session variables to be used in application
    session_start();
    $_SESSION['user']=$row['username'];
    mysql_free_result($result);
    mysql_close($con);
    header('location:logindex.php');// back to homepage if successful login
```

Figure 19. Syntax of php session

When a user is input their username and password, on the condition that data is valid, the `session_start` function will be execute. The inputted valid username can be stored in a variable `$_SESSION ['user']`. After that, the inputted data is available to displayed or used in other web page. For example, the php code in message board `<?php session_start ();?>` can be inserted in the first line of message board php file.

As I mentioned at the beginning of this chapter, the user information cannot be stored in a session forever. From network security point of view, sometimes the skilled user could peek the stored information. Therefore, the logout function should be created in the security point of view. The coding of logout function is displayed in Figure 20.

```
<?php session_start();?>
<?php
    session_destroy();
    echo "<script> alert ('logout successfully!');location.href='home.php'</script> ";
?>
```

Figure 20. Syntax of logout function

The logout function is applied in tools which are located in the website header, I designed the logout function in the way that if user clicks logout, the `session_destroy ()` function will run and destroy all the user data stored in php session. In addition, the JavaScript function will inform users that s/he has been successfully logged out through alert dialog, the web page will redirected to the login page.

5.2.3 Online Register

In the online register system, there are six variables were created as `$username`, `$password`, `$year`, `$month`, `$day` and `$gender`. Obviously there should be more variables that could store detailed information of users, but the same type of variables

has been estimated. The variable \$year, \$month and \$day keeps the birthday of users. In Figure 21, the html code presented how the variables have been created.

```
<form class="form" action="input.php" method="post">
  <tr class="usercreate">
    <td>Username:</td>
    <td>
      <input class="input" type="text" name="username" size="15">
    </td>
  </tr>
  <tr class="passcreate">
    <td>Password:</td>
    <td>
      <input class="input" type="password" name="password" size="15">
    </td>
  </tr>
  <tr>
    <td>Gender:</td>
    <td>
      <input type="radio" name="gender" value="1" checked>Male
      <input type="radio" name="gender" value="0">Female
    </td>
  </tr>
</form>
```

Figure 21. Syntax of online register html forms

In Figure 21 above, the variables were created by name property in red. After the user has inputted all the data required in the form, the inputted data should be inserted into relevant tables in the database. I created another php file named input.php. This file enables the user to create an account online. Figure 22 shows how the data has been inserted. As the result,

```
<?php
  $mysql_server_name="localhost";
  $mysql_username="root";
  $mysql_password="1234";
  $mysql_database="demo";

  $sql="INSERT INTO register (username, password, gender, year, month, day) VALUES ('$username', '$password', '$gender', '$year', '$month', '$day')";
  $con=mysql_connect($mysql_servername, $mysql_username, $mysql_password);
  mysql_select_db($mysql_database, $con);
  $result=mysql_query($sql);
  mysql_close($con);
  echo "<script> alert ('User created!');location.href='home.php'</script> ";
?>
```

Figure 22. Syntax of input.php

First of all, on the condition of the input.php has been connected to database, the defined variables mentioned in Figure 21 will be inserted into relevant table and columns. After that, the connection with database will closed, the JavaScript alert dialog will inform user that account has been created. At last, the web page will redirect from online register to home page where login system located.

5.2.4 File Uploading

The FYLX manager has indicated that the website should able to hold the files. Consequently, the trainees are able to remotely complete their practical training tasks and upload their answers in the Internet. In figure 23, the coding of html provides an input column where the user can browse files. The php syntax is inserted into html and indicates where the file can be solved.

```

<?php
    if ($_POST[upload]=="1")
    {
        $to="uploads/".$_FILES['file']['name'];
        move_uploaded_file ($_FILES['file']['tmp_name'],$to);
        echo "uploaded";
    }
?>

<form method="post" enctype="multipart/form-data">
<input type="hidden" name="upload" value="1">
<input type="file" name="file">
<input type="submit" value="Upload">
</form>

```

Figure 23. File upload syntax

The form was designed for file upload. Once a user has clicked submit button, the variable \$to was created to define where the file will be saved. In other words,

variable \$to is a folder path, the path shows where uploaded files was stored. The move_upload_file function is used to move the temporary file which copied from uploaded file into an expected folder. Once the file uploading completed, the text “uploaded” will displayed nearly upload dialog in order to inform user that the upload is completed.

5.2.5 Message Board

For achieving communication between the trainees and supervisors, the message board was designed as a platform where the trainees and supervisors can interact with each other. There are two areas mapped. For example, one is the text area where users can leave message, and the other one is the place where the message can be displayed. Figure 24 illustrates the outlook of the message board.

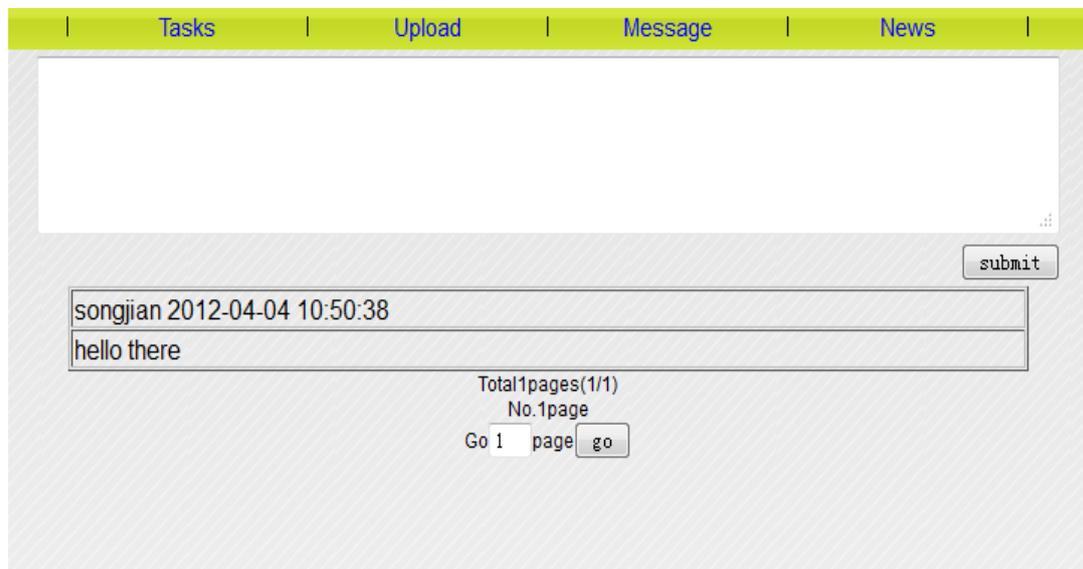


Figure 24. Outlook of message board

Users are able to input their comment or suggestions in text area. The input area is simply made by html code. The listed message is displayed by using page dividing

function, and each page only shows four kinds of message, the remaining message is displayed below. After a registered user has been inputted and submitted the message in the website, there is a php file name message_insert.php is execute in order to store the message into database. Figure 25 shows the syntax which indicates how the messages were inserted.

```
<?php session_start();?>
<?php

    $mysql_server_name="localhost";
    $mysql_username="root";
    $mysql_password="1234";
    $mysql_database="demo";

    $sql="INSERT INTO message (info,username,time) VALUES ('$info','{$_SESSION['user']}',NOW())";
    $con=mysql_connect($mysql_servername, $mysql_username, $mysql_password);
    mysql_select_db($mysql_database, $con);
    $result=mysql_query($sql);
    mysql_close($con);
    header('location:message.php');
?>
```

Figure 25. Syntax of message_insert.php

Once the message was submitted, the data will send to message_insert.php. The file will first connect the database. In the beginning, the session function will run as well in order to save the username from \$_SESSION ['user'] into message table in database. The time of message leaving will be automatically be received from the operating system by using function NOW (). In order to display the stored message, there is a php file named show_message.php was created in order to display the message user inputted. Figure 26 shows the content of show_message.php

```

<?php session_start();?>
<?php
    $mysql_server_name="localhost";
    $mysql_username="root";
    $mysql_password="1234";
    $mysql_database="demo";

    $sql="SELECT * FROM message ORDER BY `message`.`time` DESC";

    $con=mysql_connect($mysql_servername, $mysql_username, $mysql_password);
    $result=mysql_db_query($mysql_database, $sql, $con);
    while($row=mysql_fetch_row($result))
    {
        // print_r($row);
    }
?>
<table align="center" width="640px" border="1" height="30px" cellspacing="1" cellpadding="1">
    <tr>
        <font><td><?php echo $row[2] ?>&nbsp;<?php echo $row[0]?></td></font>
    </tr>
    <tr>
        <td><?php echo nl2br($row[1]) ?></td>
    </tr>
</table>
<hr width="640px" align="center">
<?php
}
mysql_free_result($result);
?>

```

Figure 26. Content of show_message.php

Same as message_insert.php, the file will connect to database in first step, then variable \$result was defined and the query result from message table can be saved into variable \$result. After that, a while loop will execute when mysql_fetch_row function fetches the data in \$result. The following break is the CSS template, it defined how the message and user information will be displayed in a web page, and which \$row [number] needs to be presented. The last step is a php function named mysql_free_result (), it dedicate to release the data from the message table in database.

5.2.6 Message Page Division

Concerned with the difference between IE browser and non-IE browser, the page

division function should be created to achieve fresh layout and succinct content of a web page. For instance, during the message board testing, I found an interesting phenomenon that in the IE browser, the height of content will be increased depending on how many messages will be displayed in message board page. However, in none-IE browser, for example Firefox, the content will be increased with the amount of message as well, but the height of content between the router and header will keep intact as it defined in the CSS file. Therefore, the displayed message was overlapped with router. In order to solve this problem, I clarified that the php pagination can solve this problem. The main content of php pager function is displayed in Figure 27 and Figure 28. Appendix 2 provides further details.

```

<?php
//Connect to database
$db=mysql_connect("127.0.0.1","root","1234");
mysql_select_db("demo",$db);
//set up records in each page I want displayed
if (!isset($_POST["gopage"]))
{
    if (!isset($_GET["page"]))
    {
        $page=1;
    }
    else {$page=$_GET["page"];}
}
else {$page=$_POST["gopage"];}
$pageSize=4;
//get total message amount, calculate pages I need
$res=mysql_query("select count(*) from message ");
$myrow = mysql_fetch_array($res);
$numrows=$myrow[0];
//calculate pages
$page=intval($numrows/$pageSize);
if ($numrows%$pageSize)
$page++;

if ($page>$pages){
    $page=$pages;
}
//calculate record excursion
$offset=$pageSize*($page-1);
$nowset=$pageSize*$page;
//get record
$res=mysql_query("select *from message order by time ASC limit $offset,$pageSize");
//display record in a loop
if ($myrow = mysql_fetch_array($res))
{
    $i=0;
    ?>

```

Figure 27. Php pager 1

In this file, the database was connected in the beginning, after which \$pagesize is used to define how many messages will be displayed in each page. Following this, the function mysql_query () will select all data stored in message. This information will be used to calculate how many pages the pagination will have.

```
//display page in go
echo "<form action='fy.php' method='post'> ";
//calculate the page number of first page, last page, next page, and end page
$first=1;
$prev=$page-1;
$next=$page+1;
$last=$pages;
if ($page>1)
{
echo "<a href='fy.php?page=".$first.">page1</a> ";
echo "<a href='fy.php?page=".$prev.">Lastpage</a> ";
}
if ($page<$pages)
{
echo "<a href='fy.php?page=".$next.">Next page</a> ";
echo "<a href='fy.php?page=".$last.">Lastpage</a> ";
}
echo "Go<input type='text' name='gopage' size='2' value=".$page.">page";
echo "<input type='submit' name='submit' value='go'>";
echo "</form>";
echo "</div>";
?>
```

Figure 28. Php pager 2

Lastly, this file in figure 28 calculates what are the value of last page, next page and End page. The links of each page are defined through super links. There is also a page selection available which provides page jump service to users. The final output of the message board pagination is presented in figure 24.

5.2.7 PHP Image Gallery

In my opinion, suitable amounts of images could develop user-friendly performance of a web page. After the discussion with my supervisor, it was agreed that the php

image gallery can be selected as a platform that presents recent news or events in the case company. After that, I contacted the company informing that the images I use will be alternatives, and the company can be choose whether they want present the events of company or the images of the company products and services. Due to the fact that image gallery involves too many php files, I designed another extra php file which can clearly show how the php gallery works. Figure 29 shows the main part of simple php image gallery file.

```

<div id="focusData_01" style="display:none"
] <dl>
    <dt><a href="http://slide.sports.sina.com.cn/n/slide_2_789_24981.html">Football match of Beijing Team</a></dt>
    <dd>http://i2.sinainmg.cn/ty/732/2009/0701/U7485P6T732D1F20667DT20120320053455.jpg</dd>
</dl><dl>
    <dt><a href="http://slide.sports.sina.com.cn/k/slide_2_786_24956.html">NBA-Basketball Match</a></dt>
    <dd>http://i3.sinainmg.cn/ty/732/2009/0701/U6604P6T732D1F20664DT20120319130604.jpg</dd>
</dl><dl>
    <dt><a href="http://slide.sports.sina.com.cn/g/slide_2_730_24950.html">Football Match between Xijia & Huangma</a></dt>
    <dd>http://i2.sinainmg.cn/ty/732/2009/0701/U6604P6T732D1F20661DT20120319100434.jpg</dd>
</dl><dl>
    <dt><a href="http://sports.sina.com.cn/cba/">CBA-Beijing team have win Shanxi team</a></dt>
    <dd>http://i0.sinainmg.cn/ty/732/2009/0701/U7567P6T732D1F20670DT20120318233334.jpg</dd>
</dl>
</div>
<!-- 抓站_焦点图 end -->
<script language="javascript" type="text/javascript">
<!--//--><![CDATA[//><!--
var FocusPic_02 = new FocusPic("FocusImg_2","BigPic_2","Number_2","TitleBox_2", 310, 256);
FocusPic_02.Timeout = 5000;
FocusPic_02.autoPlay = false;

```

Figure 29. Syntax of php image gallery

As it displayed in the figure above, the images are from online, also the super links have inserted into the syntax. Once the user clicks the image, the page will redirect to the super link, and the super link contains details information of the image. Furthermore, the images should able to display in the website, and the content is automatically changes, it means the php image gallery should display images in a circulated way. The `FocusPic_02.Timeout="5000"` indicates the time interval between two images, this time interval can be settled as any value that developers preferred,

the unit of settled value is counted as millisecond.

6 CONCLUSION

The expected output of this research is dynamic website creation for FYLX's trainee problem, and the problem can be solved through this dynamic website. In conclusion, the research was categorized in five steps. Firstly, the information was collected from the case company, and a deep understanding of the company case was required. Secondly, the methodology of the research and implementation tools were selected. Thus the implementation environment could be settled up, and the direction of the research also specified. Thirdly, the initial class diagram of the website was drawn up, and the use case of the function declared with an activity diagram through UML. Consequently, the function could be well organized by following the UML diagrams. Fourthly, the layouts and basic div structures were created. Lastly, the functions were inserted into the layouts.

Through the dynamic website creation assigned by FYLX, experience in website development has been achieved, and a plenty of php functions have been reviewed. The difference between the IE browser and non-IE browsers when they display this same CSS code were adjusted. Moreover, the knowledge of the browser differences can be used in work in future. On the basis of WAMP development environment, the functions of login system, online register, message board, logout tool, php image gallery, page dividing and session were developed.

6.1 Challenges of Implementation

Among the functions I designed in the website, the most difficult part was the combination of page division and message board, and the file uploading function. In message board, the primary design was display three elements which are username, time of message leaving and inputted message. The difficult parts were username

storage and pagination of messages. Because login system could only identify the user group, it is unnecessary to store exists username into message table in database over and again. The guidance from my supervisor suggesting me to concentrate on php session () function, because php session can store the user information temporarily. Therefore, the first problem was solved through this php function.

Furthermore, there was no problem with message display, but the height of main content of the website has settled in CSS. Therefore, the entire message only can be displayed in the limited space. With the none-IE browsers, the height of content will fixed, and the message will display as a package of mess. After a few days of literature review, I found the php pagination function which can solve the message displaying problem. With the help from my supervisor, I have combined the message displaying with php pagination.

6.2 Further Improvement

At the end of the research, even though the multiple functions have been implemented, the functions can provide all needed platforms for users getting tasks, upload answers, register them online and leave messages. However, there are still more implementations need to be created from usability and security point of view. For example, the background layout of the website and the security tools which could secure the user password and database. Due to time limitation, only the functions and essential usability were created, for further modification and development, I have left my contact information to the case company; they could contact me in future if more function were required.

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APPENDICES

Appendix 1. Entrustment From Case Company

Entrustment Agreement to further promote of our company's trainee problems, strengthen the contacts between trainees and company managers, save the limited enterprise resource, the LXNT agreed to entrust Mr. Song Jian to design and establish an English website for us. The website should be of characters as follows: simple operation, stable performance, fresh layout, and easy for management. The charges of producing the website should be decided by both sides later.

Entrustment Entity: Anhui Fuyang Lingxin Network Technology Co., Ltd,

Address: room 1004 unit 2, Long Teng Jing Xin Villa, Fuyang, Anhui province China.

Telephone: 86-558-8663688

Appendix 2. Coding of Pager Dividing

```
<?php
$db=mysql_connect("127.0.0.1","root","1234");
mysql_select_db("demo",$db);
if (!isset($_POST["gopage"]))
    {
        if (!isset($_GET["page"]))
            {$page=1;}
        else {$page=$_GET["page"];}
    }
else {$page=$_POST["gopage"];}
$page_size=4;
$res=mysql_query("select count(*) from message ");
$myrow = mysql_fetch_array($res);
$numrows=$myrow[0];
$pages=intval($numrows/$page_size);
```

```

if ($numrows%$pagesize)
$pages++;

if ($page>$pages){
    $page=$pages;
}
$offset=$pagesize*($page-1);
$nowset=$pagesize*$page;
$res=mysql_query("select *from message order by time ASC limit
$offset,$pagesize");
if ($myrow = mysql_fetch_array($res))
{
    $i=0;
    ?>
<table align="center" width="640px" border="1" height="30px" cellspacing="1"
cellpadding="1">

<?php
do {
    $i++;
    ?>
<tr>
    <td width="10%" >
        <?php echo $myrow[2] ?>&nbsp;  <?php echo $myrow[0]?>
    </td>
</tr>
<tr>
    <td><?php echo nl2br($myrow[1]) ?></td>
</tr>
<?php
}
while ($myrow = mysql_fetch_array($res));
echo "</table>" ;
}
$morepage=3;
$lesspage=3;
if(($pages-$page)<=$morepage)
    {$morepage=$pages-($page+1);}
if(($page-1)<=$lesspage)
    {$lesspage=intval($page-2);}

echo "<div align='center'>Total".$pages."pages(".$page."/".$pages.)<br>";

```

```

for($i=$lesspage;$i>0;$i--)
echo "<a href='fy.php?page=" . ($page-$i) . "'>No." . ($page-$i) . "page</a> ";

echo "No." . $page . "page ";

for($i=1;$i<($morepage+1);$i++)
echo "<a href='fy.php?page=" . ($page+$i) . "'>No." . ($page+$i) . "page</a> ";

echo "<br>";
echo "<form action='fy.php' method='post'> ";
$first=1;
$prev=$page-1;
$next=$page+1;
$last=$pages;
if ($page>1)
{
echo "<a href='fy.php?page=" . $first . "'>page1</a> ";
echo "<a href='fy.php?page=" . $prev . "'>Lastpage</a> ";
}
if ($page<$pages)
{
echo "<a href='fy.php?page=" . $next . "'>Next page</a> ";
echo "<a href='fy.php?page=" . $last . "'>Lastpage</a> ";
}
echo "Go<input type=text name='gopage' size='2' value=" . $page . ">page";
echo "<input type=submit name='submit' value='go'>";
echo "</form>";
echo "</div>";

?>

```