Implementing a Web-based Information System

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Abstract

Web-based information system aims to enhance and support information services for the user by using Internet Web technologies. The web is a system of Internet servers with supporting hypertext. The web is made up of files, called pages or home pages, comprising links to documents and resources through the internet. This system has implemented a website by using HTML, CSS, PHP, and MySQL. This web system is designed and developed for Co-operative University, Sagaing as a sample website depending on data collection. Any organizational websites (such as business organizations, e-commerce, NGOs, education, and health) can be created by using the technology of this system. Moreover, this research introduces the concepts and technology of DBMS by creating a database that can be mainly handled the information of all the students.

Key words: Web-based Information system, HTML, CSS, PHP, MySQL

1. Introduction

In developing and expanding education worldwide, technology has played an important role. In developing and expanding education worldwide, technology has played an important role. Nowadays, people are more interested in online communities and websites to share interesting information and activities. So, many people and organizations are used web-based for supporting information and services in various ways to interrelate with each other. The web-based information system is very useful in our community for education, social media, and government services. Therefore, this system is developed for supporting any organization with the use of web technologies. This system is created by two parts: creating a website and managing student data. And, the objective of this system is to allow the administrator of any organization to add and find out the personal details of a student. This paper aims to develop a web-based information system by using web technologies such as HTML, CSS, and PHP.

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Objectives

The objectives are

- To know how to use web programming languages such as HTML, CSS, and PHP for creating a website.
- To increase utilization of the internet and information technology.
- To reduce consumption of time during maintaining records of student data.
- To search the detailed data of students easily and quickly.

1.2 Web-based Information System

Web-based information system is an information system to provide information and service for users by using web technologies on the Internet. This technology is a software system and is used to manage and retrieve information by using the hypertext principle. The Web-based information system is a combination of specific functionality-oriented elements of one or more web applications such as web browser is used as a front end and all the databases are used as a back end (UKEssays, 2017).

1.3 Web-based Applications

A web-based application is all programs that is accessed using HTTP over a network connection, rather than existing within the memory of a computer. In a web browser, web-based applications run that also can be client-based, where a small part of the program is downloaded to the computer of a user, but processing is performed via the internet on an external server (Technopedia, 2017).

The scope and complexity of current web applications vary widely: from small-scale, short-lived services to large-scale enterprise applications distributed over the Internet and contribute to intranets and extranets. Web-based applications can be grouped into the following seven categories (Worwa, 2010):

- informational, e.g. online journal, catalogs of the item, newsletters, service manuals, online classifieds, electronic online books;
- interactive, e.g. registration forms, customized information; presentation given by the user, online games;
- transactional, e.g. online banking, electronic shopping, ordering goods and services;

- workflow e.g. inventory management, status monitoring, online planning, and scheduling systems;
- collaborative work environments, e.g. collaborative design tools, distributed authoring systems;
- online communities, marketplaces, e.g. chat groups, recommender systems;
- Web portals, e.g. online intermediaries, electronic shopping malls.

1.4 Web Programming

Web programming refers to Web development writing, markup, and coding, which comprises Web content, Web client and server scripting, and network security. The most prevalent languages applied for Web programming are XML, HTML, JavaScript, Perl 5, and PHP. Web programming, which includes interdisciplinary knowledge of the application field, client and server scripting, and database technology, is different from just programming (Technopedia, 2017).

It is possible to briefly categorize web programming in client and server coding. The client side requires programming related to user data access and information provision. It also requires to secure that suitable plug-ins, including security controls, are available to enhance the user experience in a graphical user interface (Technopedia, 2017).

(1) JavaScript is commonly operated to enhance user experience and related features on the client side. It is the best client-side platform for developing and integrating Web applications.

(2) According to other application frameworks support, HTML and CSS provide the majority of client-side functionality.

Mainly associated with data retrieval, protection, and performance, the server side requires programming.

1.5 Architecture of Web-based Systems

Client Server and 2 tier Web Architectures

The user usually uses Web Browser applications such as Mozilla Firefox or Google Chrome while the user is surfing the Internet. The computer is run a browser is called a client, while a machine is called the server that provides Web pages. When the user dials up to an Internet Service Provider (ISP) such as Blue Yonder, Aol, the network connection to a Web server is started by the computer of the user. In this case, the user's computer is in effect a client, which is connected to the Web server of ISP, and then the web server provides the Web Pages in the browser of the user. This simple scenario is known as a 2-tier architecture model, where one or more clients are linked to the Web server.

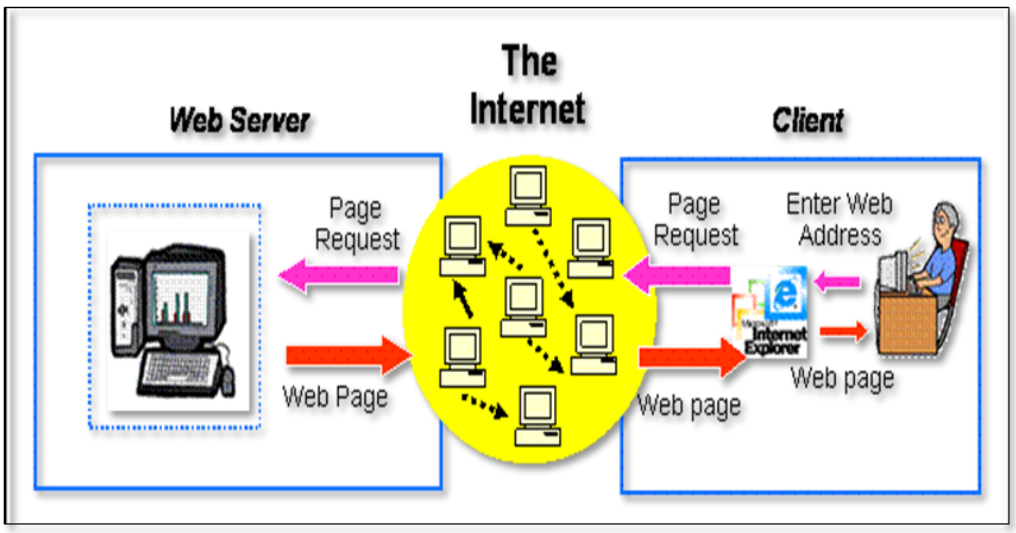


Figure - A simple diagram of 2 tier Client/server architecture

Source: https://teaching.shu.ac.uk

2. Technology

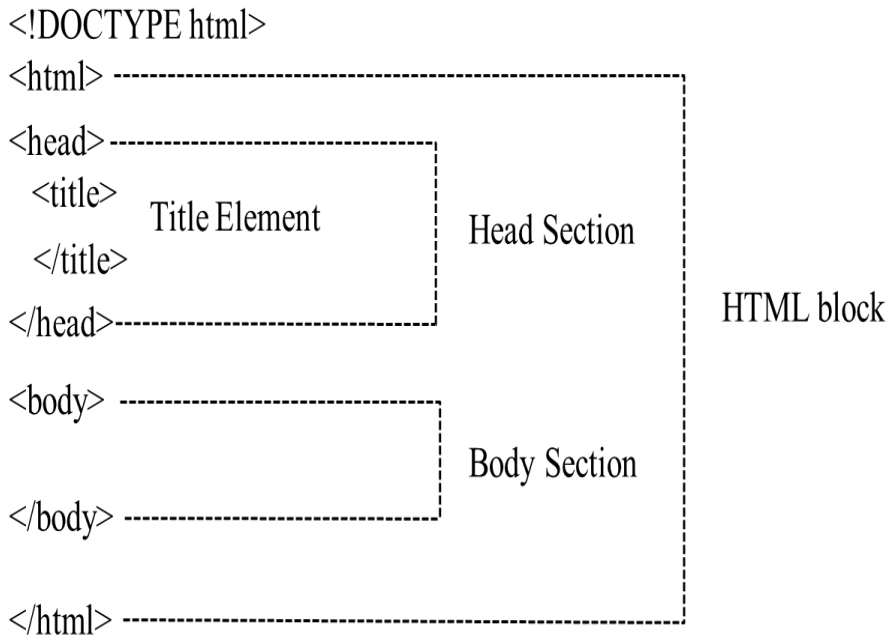
2.1 HTML (Hyper Text Markup Language)

According to Felke-Morris (2013), HTML is a set of mark-up symbols or codes that are stored in a file to be displayed on a web page. The structural elements such as paragraphs, headings, and lists are specified by these markup symbols and codes. HTML may also be used to place media (such as graphics, video, and audio) on a web page and show fill-in forms. The browser interprets the code for the markup and renders the page. HTML allows the platform-independent show of information through a network. Any

kind of computer was developed a web page, that the page can be viewed by any browser running on any operating system.

Each markup code is referred to as an element of the tag. All of the tags have an objective. Tags are enclosed with the < and > symbols in angle brackets. Most of the tags emanate with the pairs of opening and closing tags that the tags carry out as containers and occasionally as container tags. For example, on a web page, the text between the <title> and </title>tags would show on the browser window's title bar. Some tags are used on their individual and do not configure part of a pair. For instance, a <br> tag is a stand-alone or self-contained without a closing tag that appears as a line break on a web page. The majority of tags can be changed with attributes that more describe their purpose (Felke-Morris, 2013).

2.1.1 HTML Structure



Source: Tim Berners-Lee in late 1990

2.1.2 HTML Tag

Table 1. Some Example of HTML Tag

Tags	Purpose
<head> </head>	Configure the head section.
<title> </title>	To show the beginning and ending of a page title.
<body> </body>	To indicate the body of the document has begun and then indicate it is ending
 	To produces a single line break.
	To define a division or a section in a document.
<h1> to <h6>	To defines HTML headings.
<hr>	To display a horizontal line.
	To defines a paragraph.
	To displays text in a smaller size.
	To displays text in a bold style.
<u> </u>	To displays text with an underline.
	To displays text in an italic style.
<a > 	To indicate a link to another file or page.
< /li>	Creates an order list.
<table> </table>	To define a table.
<tr> </tr>	Configure a row inside a table.
<td> </td>	Configure a column inside a table.

Source: Terry Felke-Morris, 2013

2.2 CSS (Cascading Style Sheets)

Felke-Morris (2013) describes to distinct the web page design from the data on the Web page, web designers use CSS. CSS text, color, and page layout are utilized to organize them.

2.2.1 Method of CSS Technology

Inline Style Sheet

Inline Style Sheets are encoded as an attribute of an html tag in the body of a web page. This style uses the particular element comprising an attribute in html tag (Felke-Morris, 2013).

```
<p style=“color:green; margin-left:30px">
This is the first paragraph. </p>
```

Internal Style Sheet

In the header of a web page, Internal Style Sheets are defined. These style instructions are applicable to the entire document on the web page. There is a specific style to a single document. In the head section, it defines internal styles with the <style> tag (Felke-Morris, 2013).

```
<head>
    <style type=”text/css”>
      body { background-color:lightblue }
    </style>
</head>
```

External Style Sheet

In a separate text document, External Style Sheets are encoded. By using a link element in the header section, this text file is associated with the web page (Felke-Morris, 2013).

```
<head>
        <link rel=“stylesheet” href=“style.css” type=“text/css”>
</head>
```

2.2.2 CSS Basic Properties

The following properties are some basic CSS properties (Felke-Morris, 2013):

- Text Properties
- List Properties
- Border Properties
- Font Properties

Table 2. Example of CSS Properties

FONT	**BORDER**
Font font-family font-size font-style font-variant font-weight	border border-color border-style, border-width border-bottom, border-left, border-right border-top
TEXT	**MARGIN**
color direction letter-spacing text-align text-decoration text-indent, text-shadow	margin margin-bottom margin-left margin-right margin-top
BACKGROUND	**PADDING**
background background-color background-image background-position background-repeat	padding padding-bottom padding-left padding-right padding-top

Source: Terry Felke-Morris, 2013

2.3 PHP

Kauashik (2010-2011) states that PHP is a general-purpose scripting language that is particularly appropriated for web creation on the server side, where PHP generally runs on a web server. PHP is provided many databases (MySQL, Oracle, Sybase, Informix, Generic ODBC). It is an open source software that can be downloaded and used absolutely free. There can be text, HTML tags, and scripts in PHP files. PHP code is encoded in the HTML document and interpreted by the web server of PHP processor module that creates a document for the web page. The PHP runtime executes some PHP code in the requested file, normally to generate dynamic content for the web page. It can also be applied for client-side GUI applications and command-line scripting. PHP can be applied for several relational database management systems (RDBMS) on many web servers and operating systems.

2.4 MySQL

MySQL is a relational database management system (RDBMS) that operates as a server that provides many databases with multi-user access. MySQL is a standard database selected for use in web applications and is a software that is open source. MySQL database setup processes vary from host to host and end up with a database name, a user name, and a password. A table needs to be created before using the database. A table is a part of the database where information related to it is stored. The various fields that a table can use and define. The execution of basic SQL statements is another way to build phpMyAdmin databases and tables. To store data, the use of a Relational Database Management System (RDBMS) has many benefits such as easier data management, retrieval and updating, better data organization, greater flexibility in accessing and managing data, better security and data integrity (Kauashik, 2010-2011).

2.5 XAMPP

Kauashik (2010-2011) states that XAMPP is a small and light Apache distribution consisting of a single package of several web development technologies. Its contents, small size, and easily make it the perfect tool for students to develop and test in PHP and MySQL application. XAMPP can be freely downloaded as a full package and lite package. Although a large number of development tools are available for the full package, XAMPP lite includes the essential technologies that encounter the Ontario Skills Competition standards. A small package involving Apache HTTP Server, PHP, MySQL, phpMyAdmin, Openssl, and SQLite that is light.

3. Web Development Process

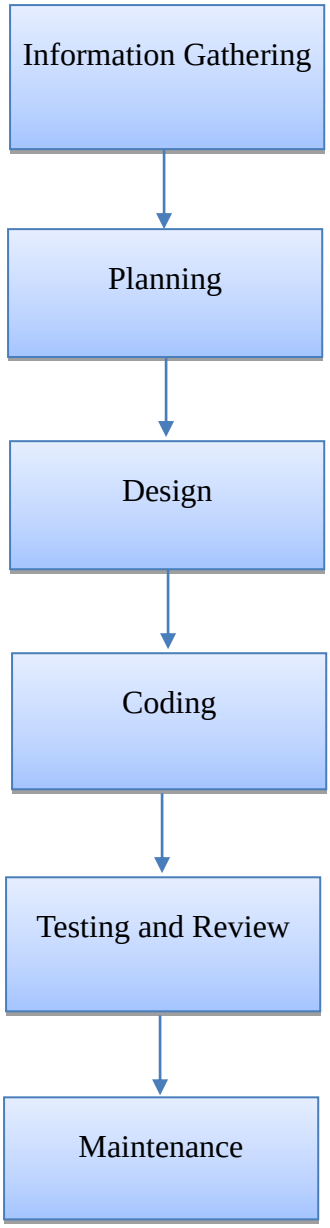


Figure 2. Web Development Process

Source: Own Creation Design

3.1 Structure of the Website

As diagram below shows, the website is composed of four main areas: Home page, about, Organization, Department, Teaching and Learning (include Teaching Environment and Student Activities), Admission and Contact Us. Each web page is connected each other and users can have access to any page.

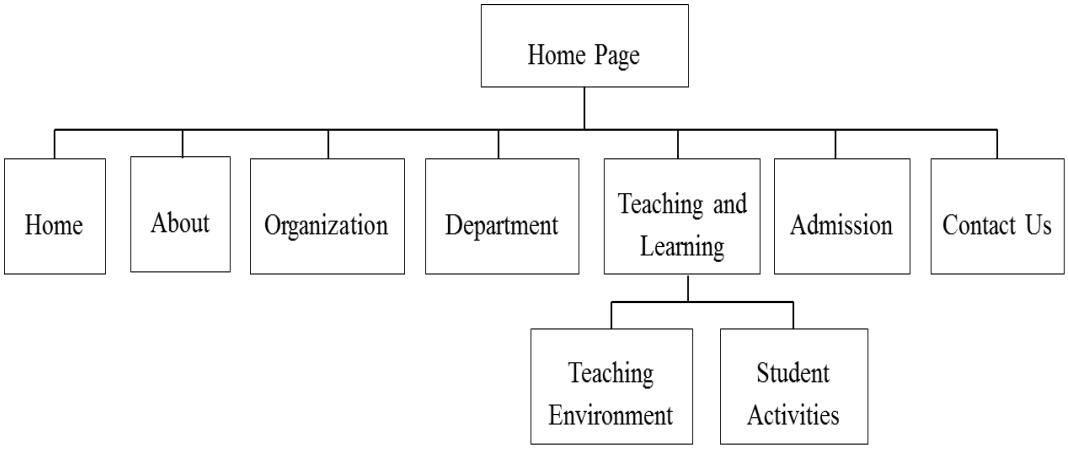


Figure 3. The structure of the Co-operative University (Sagaing) website

Source: Own Creation Design

3.2 Page Layout Design

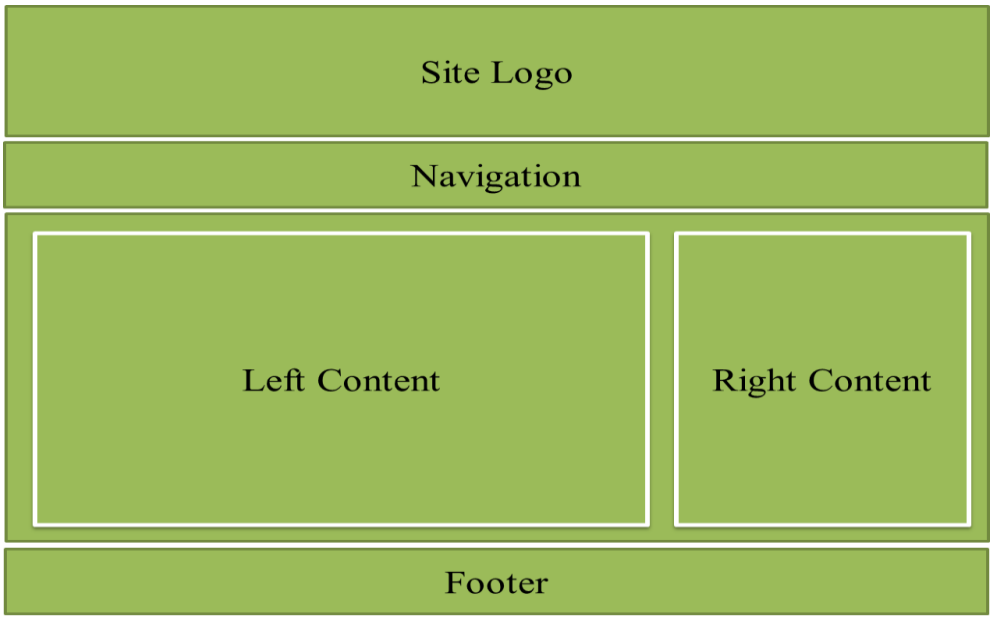


Figure 4. Page Layout Design

Source: Own Creation Design

3.3 Data Design for Administrator

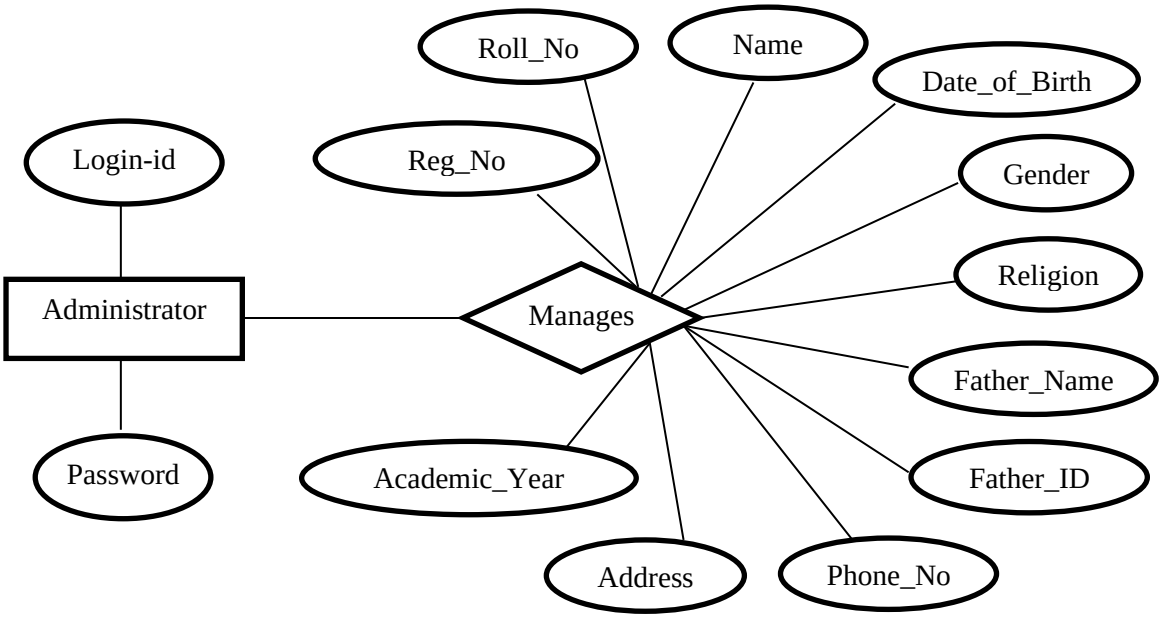


Figure 5. Entity Relationship Diagram

Source: Own Creation Design

3.4 Decision Tree for Administrator

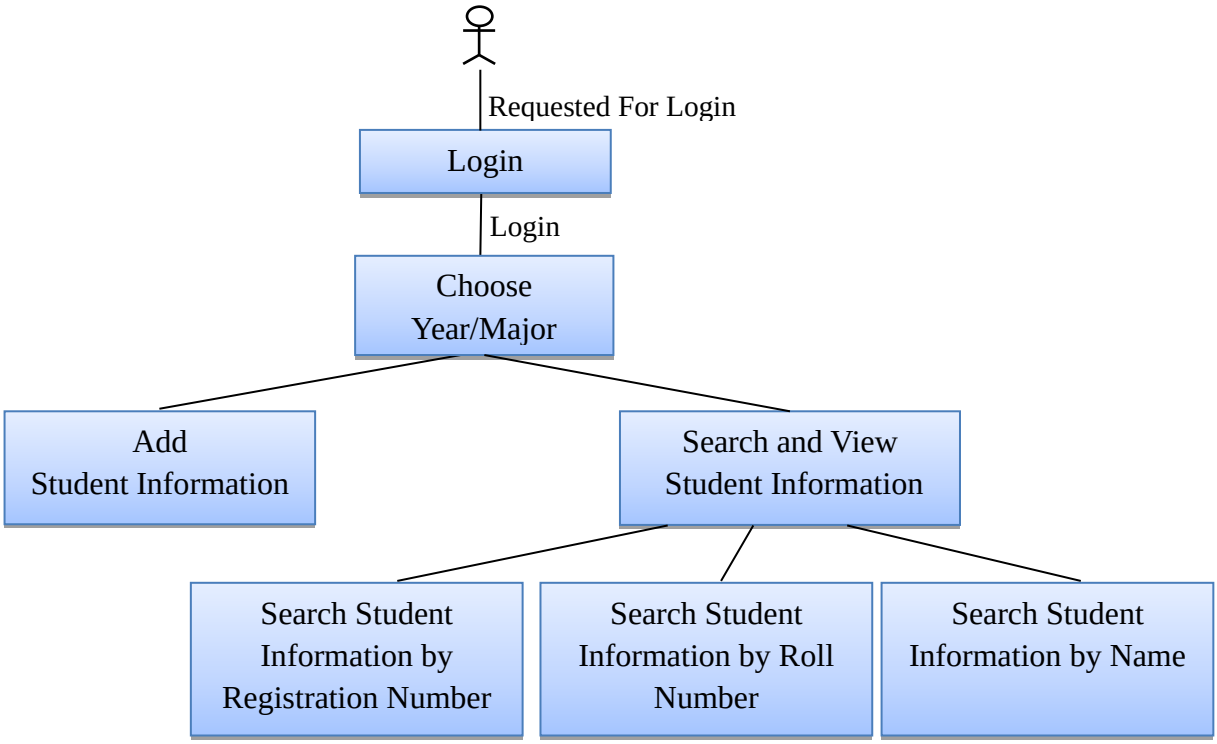


Figure 6. Decision Tree for Administrator

Source: Own Creation Design

4. Web Page Implementation

Home Page

The home page of Co-operative University, Sagaing website contains faculty/staff and news links of Co-operative University, Sagaing. Each News title links are hyperlinked to a web page which contains detailed information of this news. The website also displays an animation for some Photos of University campus and building and activities on the home page.

Figure 7. “Home Page” of Co-operative University, Sagaing website

Organization Page

This page contains an organization chart that describes the organization structure of Co-operative University (Sagaing).

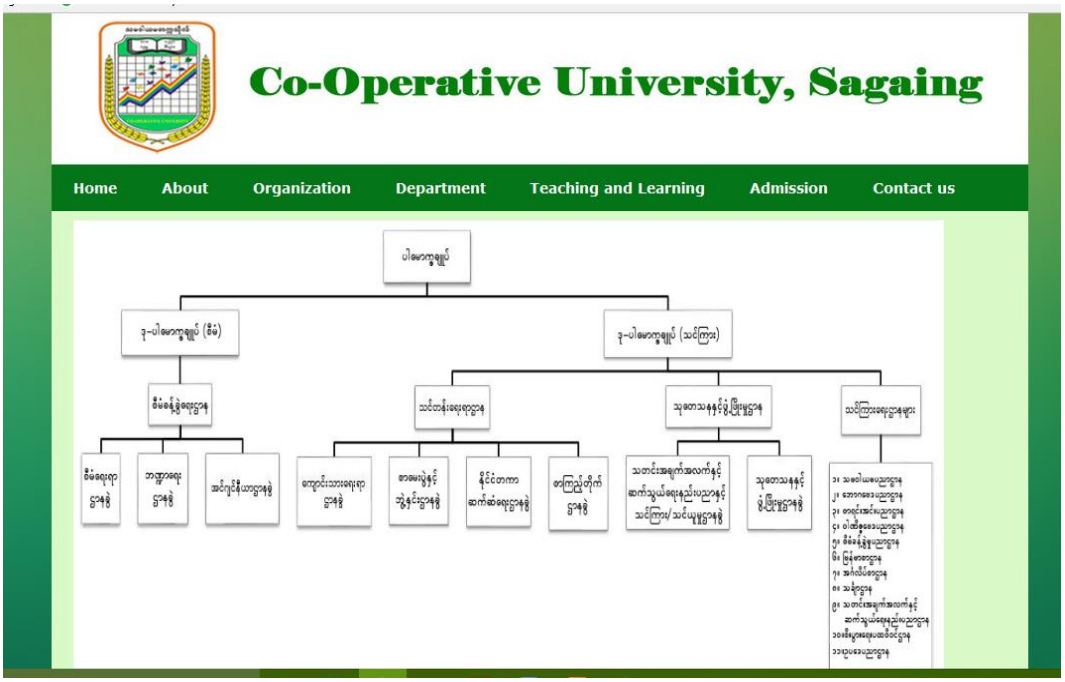


Figure 8. “Organization” web page

About Page

This page contains the history and general information (such as venue, area, vision and mission) of Co-operative University, Sagaing, and awarded degree lists.

Figure 9. “About” web page

Department Page

The department page includes departments list of Co-operative University, Sagaing and the list of course and syllabuses.

Figure 10. “Department” web page

Teaching Environment Page

This page includes some photo of teaching room (such as computer room, language lab, and library and e-Library room) of Co-operative University (Sagaing).

Figure 11. “Teaching Environment” web page

Activity Page

The activity page includes some photos of student activity (such as Fresher welcome, Sport, Htamane pwae, Water Party) of Co-operative University, Sagaing.

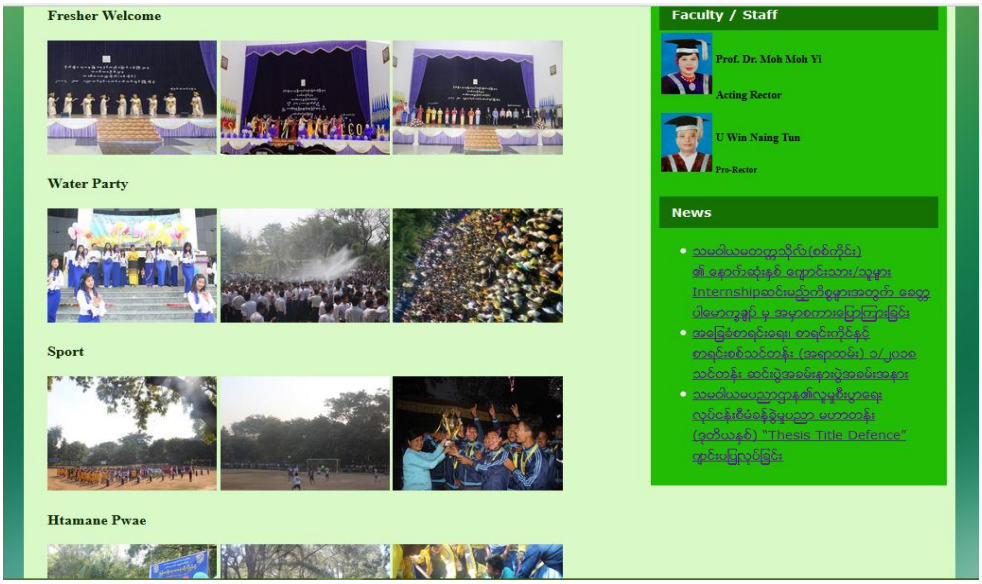


Figure 12. “Activity” web page

Admission Page

The admission page includes admission requirement for graduate program (such as admission criteria, program structure for Bachelor Degrees, Master Degrees, and duration of program) of Co-operative University, Sagaing.

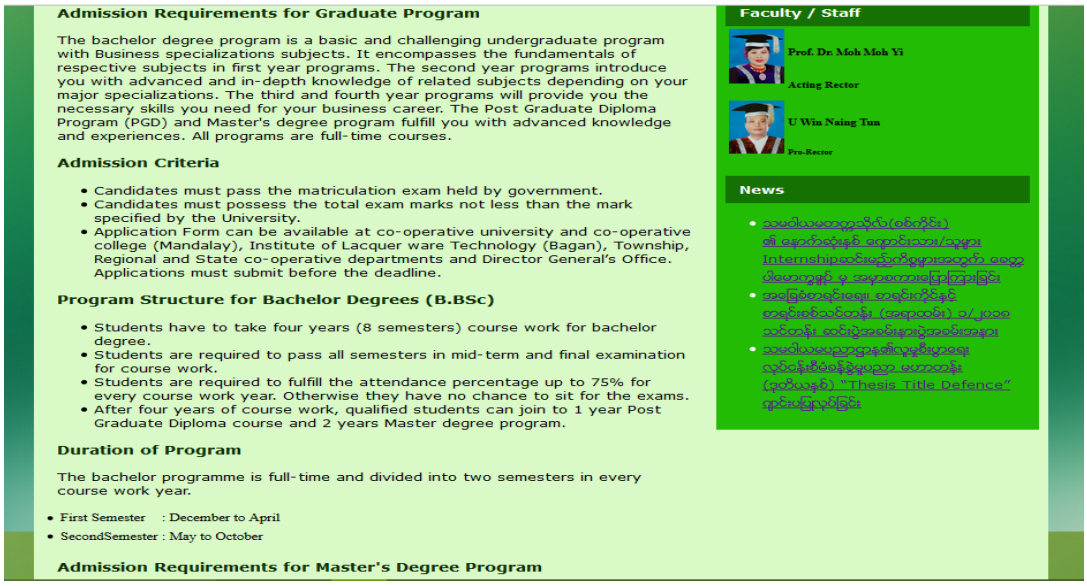


Figure 13. “Admission” web page

Contact us Page

This page describes to contact address such as telephone number, fax number, E-mail and Facebook page of Co-operative University, Sagaing.

Figure 14. “Contact us” web page

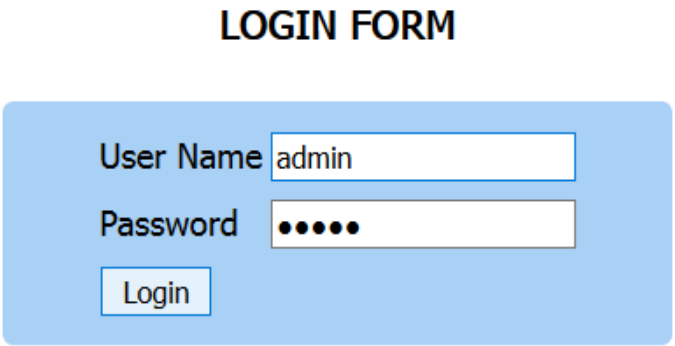
News Pages

This News Pages contain detailed information regarding the news of Co-operative University (Sagaing).

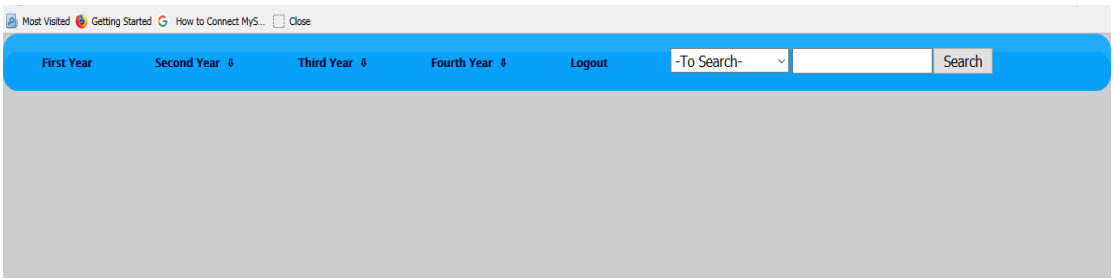
Figure 15. “News” web page

Figure 16. “News” web page

Admin Login Page



Menu Page



Add Student Detail Form

Add Student | View Student | Menu

Add Student Detail

Registeration No:

Roll No:

Name:

Date of Birth (YYYY,MM,DD) :

Gender: Male Female

Religion: -Select Religion-

Father Name:

ID of Father:

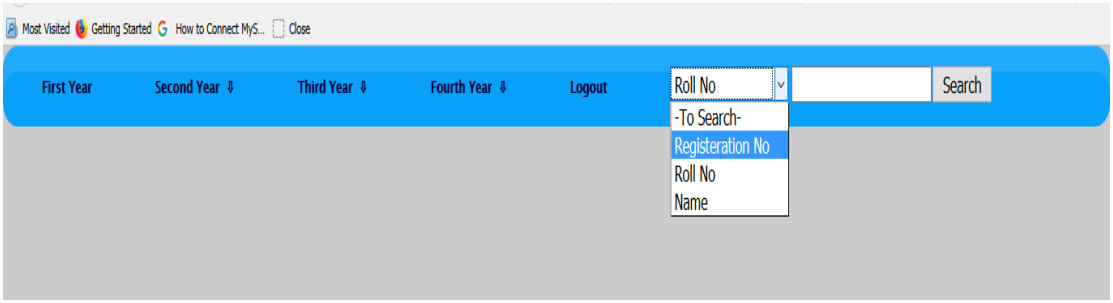
Phone Number:

Contact Address:

Academic Year:(YYYY-YYYY)

Add Clear

Searching Student Data with Roll Number or Registration Number or Name



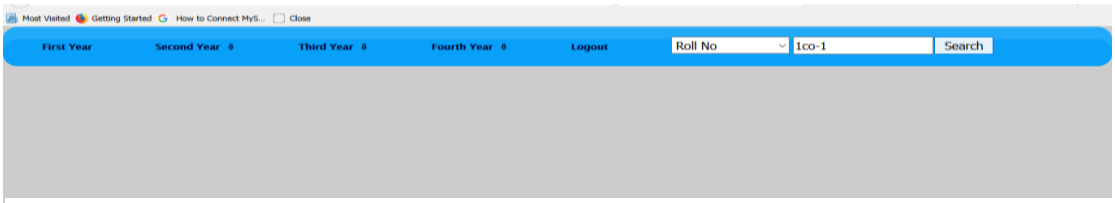
Searching Results by Registration Number

Search Result

Back

Sr. No	Registeration No	Roll No	Name	Date of Birth	Gender	Religion	Father Name	Father ID	Phone No	Address	Academic Year
1	22220001	2AF-1	Ma Ei Ei Tun	1999-02-23	Female	Buddhist	U Soe Tun	9/matala(n)016655	943016630	Mandalay	2015-2016

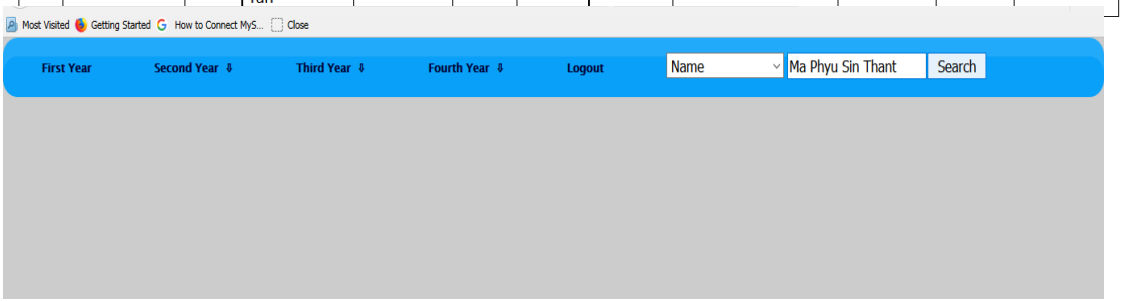
Searching Results by Roll Number



Search Result

Back

Sr. No	Registeration No	Roll No	Name	Date of Birth	Gender	Religion	Father Name	Father ID	Phone No	Address	Academic Year
1	110001	1co-1	Ma Thin Yuzana	2000-07-17	Female	Buddhist	U Soe Min	9/matala(n)001675	996500881	Mandalay	2013-2014
2	1110001	1co-1	Ma Nilar	1999-09-30	Female	Buddhist	U Mya Mg	9/matala(n)06064406	9402626890	Kyaukse	2014-2015
3	11100001	1co-1	Mg Aung Myint Thu	1998-12-12	Male	Buddhist	U Aung Thu	9/mahtala(n)061616	9402528822	Meiktila	2015-2016
4	11110001	1co-1	Ma Phyu Sin Thant	2000-05-24	Female	Buddhist	U Thant Zin	9/matala(n)026615	9402629970	Sagaing	2016-2017
5	11111001	1co-1	Ma Shwe Yi Tun	2001-01-27	Female	Buddhist	U Wai Yan	9/matala(n)025502	9965559088	Mandalay	2017-2018



Search Result

Back

Sr. No	Registeration No	Roll No	Name	Date of Birth	Gender	Religion	Father Name	Father ID	Phone No	Address	Academic Year
1	11110001	1co-1	Ma Phyu Sin Thant	2000-05-24	Female	Buddhist	U Thant Zin	9/matala(n)026615	9402629970	Sagaing	2016-2017

5. Findings and Discussions

A document on the World Wide Web, containing an HTML file and any associated script and graphics files, and sometimes linked to other web documents. HTML is a markup language that is a collection of markups tag. For defining web pages, it uses markup tags. HTML is the language used to help users interpret online documents. Structured documents cannot be presented without style sheets, and there is nothing for style sheets to present without structured documents. PHP is a commonly

used open source server-side scripting language for web development and may be embedded into HTML. With the use of MySQL, the administrator can add, modify and search the information for specific student data from the database.

Conclusion

This system is a very useful and convenient tool for a university, or department, or business to manage its online information. This paper focused on creating a website to provide information via the internet. This system helps the administrator to easily access the information of students. Web technologies such as HTML, CSS, PHP, and MySQL are used for the creation and implementation of web-based information systems and student data management. This system can be extended for any business organization, any government organization, and educational websites.

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