

WEB MANAGEMENT SYSTEM FOR SERIOUS GAME IN INTERNAL
MEDICAL PRACTICE

by

Phoon Wei Yin

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ABSTRACT

The project is to develop a web management system for serious game in internal medicine practice. The objective of this project is to develop a web management system for managing user's data in serious game for internal medicine practice. In addition, the web management system can be functional in register, login, and logout, forgot password, change password, manage user, create patient profile, assign patient, delete patient profile and view log. There are some databases required for the web management system that is register table, patient table and assign table. XAMPP is the main software to develop the web management system. The web management system is using PHP as a server-side language and MySQL as database. The admin enables to use the web management system to manage user's data in the serious game.

Keywords – web management system, serious game, database, PHP language and MySQL

ABSTRAK

Projek ini adalah untuk membangunkan sistem pengurusan web untuk permainan yang serius dalam amalan perubatan dalaman. Objektif projek ini adalah untuk membangunkan sistem pengurusan web untuk menguruskan data pengguna dalam permainan yang serius untuk amalan perubatan dalaman. Di samping itu, sistem pengurusan web boleh berfungsi dalam daftar, masuk dan keluar, lupa kata laluan, kata laluan perubahan, mengurus pengguna, mencipta profil pesakit, memberi pesakit, memadam profil pesakit dan pandangan log. Terdapat beberapa pangkalan data yang diperlukan untuk sistem pengurusan web yang mendaftar jadual, jadual pesakit dan menetapkan jadual. XAMPP adalah perisian utama untuk membangunkan sistem pengurusan web. Sistem pengurusan web menggunakan PHP sebagai bahasa pelayan-sampingan dan MySQL sebagai pangkalan data. Admin membolehkan untuk menggunakan sistem pengurusan web untuk menguruskan data pengguna dalam permainan yang serius..

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PART 1

INTRODUCTION

1.1. Introduction

What is a web management system? Web management system is a content management system that provides user-friendly and maintains web pages. It usually sits on a web server and allows the user through a browser interface. The web management system can be accessed by a browser that is admin and user can add and maintain the content from the computer which is needed to install the browser.

In this paper, the web management system includes web pages and a database. The web page for the web management system is developed by PHP (Hypertext Preprocessor). PHP is a server side scripting language. It used for creating dynamic web pages. PHP code can be embedded directly into HTML source code to process the data. The advantage for the PHP is fast, stable, secure, easy to use and open source.

In addition, the database part is done by the MySQL database. MySQL is an open source database system. It is also a relational database system that is used to store the information and data. It can store many types of data such as graphics. The information stored in MySQL database can be updated time by time but it requires accessing the Internet.

1.1.1 Problem Statement

There are some problems in web management system for serious game in internal medicine practice. Firstly, the management system has some difficulties to manage the user data which is patient's data in virtual, the user's data for medical students, and admin's data for medical doctor, and patients and doctor relation. The system is hard to distribute and manage the data because it contains many data about the users and virtual patients. In addition, the web management system cannot be a standalone application because the data for the system need to be updated. They cannot get the updated information for the system.

1.1.2 Objectives

- i. To develop a web management system for managing user's data in medical serious game.
- ii. To develop a web management system to be used by medical doctors and their students.
- iii. To develop an online web management system using current web technology.

1.1.3 Scope

- i. The functions for the user (medical students) that is login or logout, sign up, forgot password, change password, view chatting window and view treatment window.
- ii. The functions for the admin (medical doctor) is included managing user and manage patient.

1.2 Reviews of previous work research and relate to current projects

Web management system is software and tools that allow an organization to construct, edit, manage and publish electronic text. to (D. Świerad, W. Zabierowski and A. Napieralski, 2009), they are creating a content management system by using Ajax technology. The content management system is simple and convenient to use. The website is providing information, the interaction between users and web pages. They are chosen PHP as a programming language. There is some reason:

- High scalability and performance – PHP can design small and large application. It also can be used to create a homepage.
- PHP is easy to learn and suggest good documentation.
- PHP also supports some extensions and plugins.
- There is some web hosting using PHP scripts.

They are chosen MySQL as database. MySQL are look like PHP because it provides MySQL database. It is unusual to find PostgreSQL and other databases. jQuery also chosen as JavaScript framework. There is some reason why they choose jQuery:

- jQuery is fast and small
- There are some plugins written for jQuery
- It has a large set of documentation
- It also supports the Ajax request

According to (Jianhua R., Hui Ding and Xiaoyan Y., 2010), they design education science teaching website by using ASP technology. They assumed ASP technology as the onstage development tools and ACCESS technology as manage the backstage teaching database. The database design for the educational website is using Microsoft Access 2003. Microsoft Access 2003 is easy to use and small-medium sized database. It also prevents insecure code by setting macro levels. It can be set secure level while the VBA codes in the database are opened. The website uses ASP technique to develop the front page, review the teaching data with Access on the back page and interact by using ASP and database. The Active Server Pages are a technique for web

page development. The ASP technique can be edited, update and delete the database on the server.

According to (Hong Pan et al, 2010), they construct a complete e-commerce web page by using JSP. The e-commerce website based on JSP technology includes news and main modules. JSP act as a developmental language for the website. There is some advantage for JSP:

- Good scalability with the Java Enterprise platform to construct web application based on Java platform
- Multiplatform support in the system

They are chosen Microsoft SQL Server 2003 as database. Microsoft SQL Server 2003 has four advantages:

- Reliability
 - It is the most reliable and secures Windows server operating system. It gives the security of the business information and make sure that user can access to the messages of commercial.
- Efficiency
 - It provides many tools to help the user to reduce use of management and network structure. It also allows the user to support more jobs and reduce the cost.
- Connectivity
 - It provides a scalable platform for the user and customers. It also provides built-in services make the system easily to develop and manage XML Web Services.
- Economical
 - It provides the guidelines to ensure that user easily to get use the technology such as latest hardware, software and methods

According to (Bo Qu and Zhongxue Y., 2012), the design and implementation of an embedded secure CGI daemon. They also integrate a CGI based secure HTTP server to support specification of CGI. There are two main parts: designing of CGI based secure HTTP server and designing of CGI daemon. The designing of CGI based secure HTTP server are using two programming:

- SSL Programming
 - SSL (Secure Socket Layer) protocol situated between the application layer and the transport layer. It also secures the HTTP protocol and become a secure web services for communication.
- HTTP Server Programming
 - HTTP Server supports the specification of CGI so that files services are simplified for reserve the functions. For the file service, it transfers the type and length of content required. Regarding to the specification of CGI, the interaction between HTTP server and CGI program is through standard input and output. There are two functions which are used for information transmit from an HTTP server to CGI program and to achieve the corresponding transmissions.

The designing of CGI daemon is using the CGI programming. The general feature of the CGI programming: when it is requested, the HTTP server will be loaded and executed, but while the HTTP connection is closed, the executed process will end. The program will be loaded and executed through server while the program is requested again. The CGI program can use in creating a new password via the system and deliver it to the user's mailbox. Hence, the user can get their new password by using a CGI program.

1.3 Explain the current system and its limitation

Adobe Dreamweaver CS5.5 is website design software. It is suitable for constructing complex web sites. In the below, it shows the specifications and limitations of Adobe Dreamweaver CS5.5.

| Content | Adobe Dreamweaver CS5.5 |
|---------------------------------|---|
| Web design | WYS/WYG editor, HTML editor, Image editor, graphics, templates, design preview and drag and drop |
| Features | Photo gallery, YouTube videos, Flash, Blogs, Google maps and banner advertising |
| Publishing | Upload manager and website hosting |
| Supported programming languages | HTML, CSS, and PHP |
| Operating System | Windows 7, Windows Vista and Windows XP |
| Limitation | It is complex to use because there is many features will make the user become messy. It is also expensive to be used. |

After review of previous work and study on an existing system, some techniques are studied. There will be some techniques have been selected to use in this project in order to create a Serious Game website.

- a. PHP language – is easy to learn and build the website
- b. HTTP server – is the protocol used to link to a web server on the local network. It also creates a linking with the server and deliver HTML pages in a web browser.
- c. MySQL database – data for related data will be stored in tabular form
- d. Visual Basic – provides a graphical user interface for the system

1.4 Terminology

- i. Serious Game: Serious game is a game where education is a main goal compare to the entertainment.
- ii. Medical Treatment: Medical treatment is about the medicine applied, surgery and psychotherapy.
- iii. Web platform: Web platform work with the public content of website.
- iv. Web content management system: It is software that belongs to the server and replaces web pages such as the website is being displayed.
- v. Database: It is an application that arranges data and makes the storage fast and data retrieval.

1.5 Methods of Approach and Scope

- a. Software
 - i. XAMPP – Main software to build the website and user interface
 - ii. Visual Studio – Used to create the graphical user interface
- b. Hardware
 - i. Laptop – Windows 7, 4.00 GB RAM and 32-bit Operating System
- c. Technique
 - i. PHP language
 - ii. HTTP server
 - iii. MySQL database
 - iv. Visual Basic

1.6 Outlines

1.6.1 Data Collection

The data collection techniques used for gathering user requirement is using survey questionnaires (refer Appendix 1). A survey will be conducted using Google Docs among University Malaysia Pahang. The participants answer all the required questionnaires. The survey questionnaire consists of 14 questions. The question is divided into five parts which is related to each module of the project.

1.6.2 System Flow

1. Login
 - 1.1 Sign up
 - 1.2 Forgot password
2. View Chatting / Treatment Window
3. Manage User
4. Manage Patient
 - 4.1 Create patient profile
 - 4.2 Assign patient
 - 4.3 Delete patient profile
5. View Log

1.6.3 Development Flow

The software methodology is being to use is the ADDIE model in the construction of the Serious Game. The ADDIE stands for Analyze, Design, Develop, Implement and Evaluate. It is an Instructional Systems Design (ISD) model. It helps to build better design for our project.

- a. Analyze – identify the problem, goal and objectives
- b. Design – design the storyboard by sketching on the paper
- c. Develop – develop the storyboard based on the design phase
- d. Implement – system disturb to the user and get the user feedback
- e. Evaluate – review the whole system performance

PART 2

REPORT BODY

2.1 User Requirement

The data collection techniques used for gathering user requirement is using survey questionnaires (refer Appendix 1). A survey will be conducted using Google Docs among University Malaysia Pahang. The participants answer all the required questionnaires. There is 43 students have participated in the survey. The survey questionnaire consists of 14 questions. The question is divided into five parts which is related to each module of the project. In the report, there are only two part's results will be shown. First part is the general question of Serious Game and another part is my module which is an analysis the online learning platform and web based application.

1. These are the general questions about Serious Games.
 - a. Do you think a game that simulates internal medical practice can be an effective learning method/tool for medical student?
 - b. Do you think the learning process in playing such game can be more effective than traditional learning (reading, lecture session, and so on)?

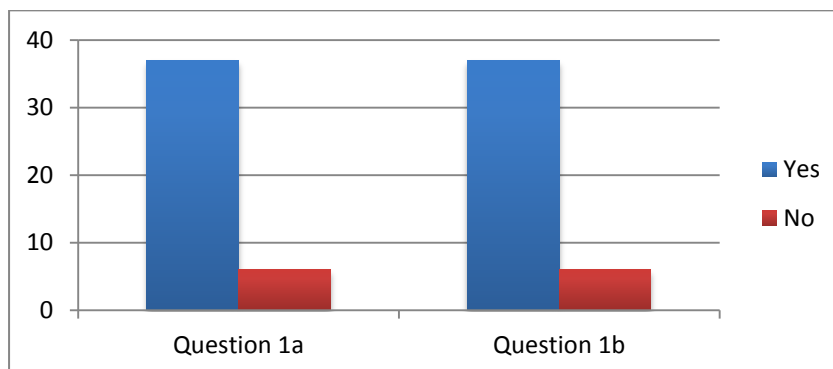


Figure 1: General Question of Serious Game

The chart shows the feedback for the respondents in Serious Game. There are 37 respondents answered that a game that simulates internal medical practice can be an effective learning method/tool for medical student. In addition, 37 respondents answered that the learning process in playing such game can be more effective than traditional learning (reading, lecture session, and so on). This shows that the student agrees to take the Serious Game as learning and training method for their studies. They choose Serious Game in learning and studying method are more efficient rather than traditional learning such as reading and teaching.

2. There are the questions in online learning platform and web based application for the Serious Game.
 - a. Do you think an online learning platform will improve the interaction between student and doctor/lecturer?
 - b. Do you think a web-based application that requires internet connection will be a problem for you to play the game?

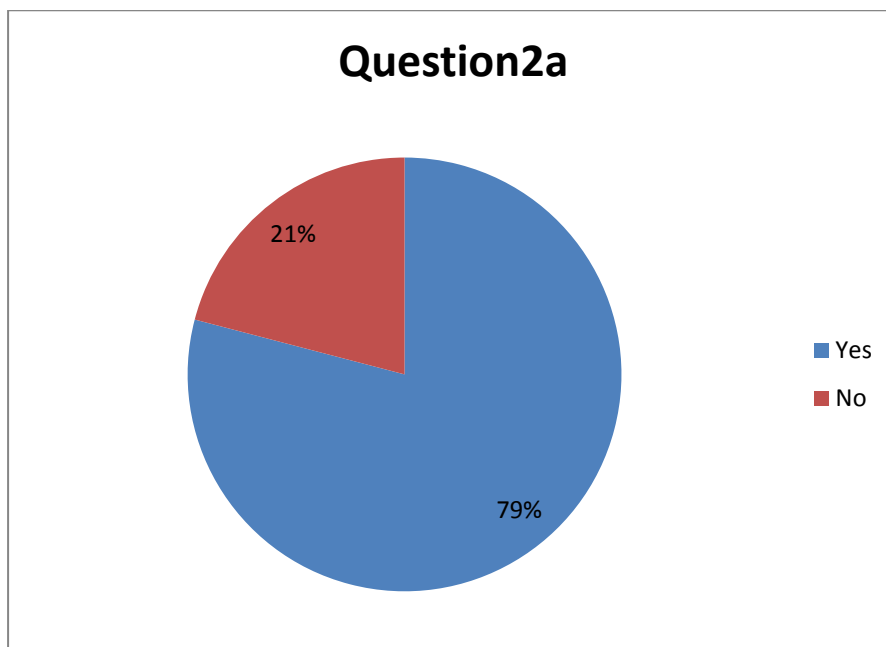


Figure 2: Online learning platform

The pie chart shows that respondent's choice for the online learning platform in Serious Game. There are 79% of the respondents choose that online learning platform will improve interaction between student and doctor. This is because the user can find a doctor in anytime while they are encountering the problem.

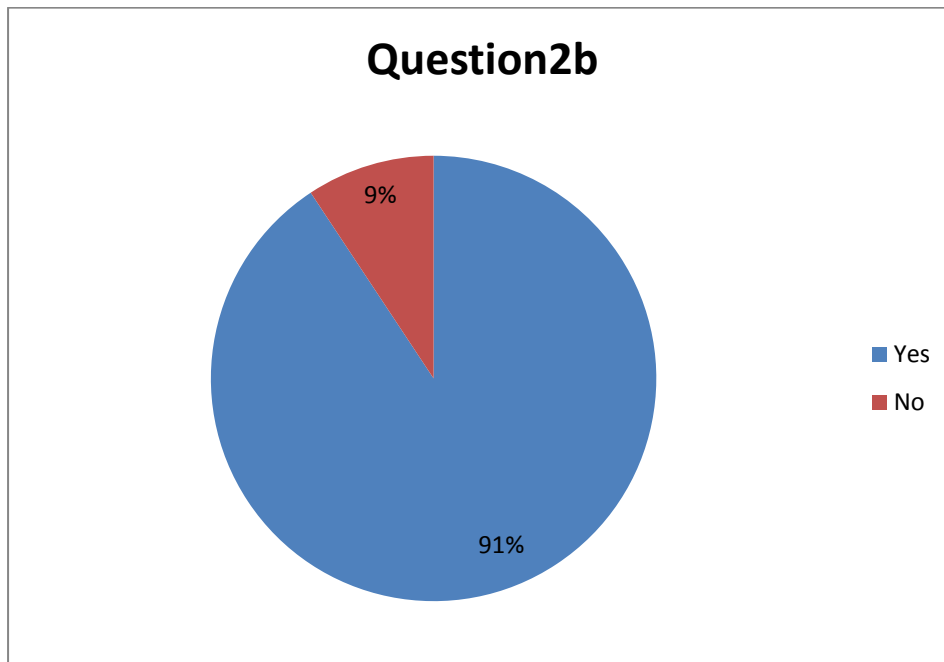


Figure 3: Web based application

The pie chart shows the respondents' feedback of web based application in Serious Game. There are 91% of respondents answered that web based application requires internet connection will be a problem to play the Serious Game. This is because certain places cannot connect the internet to play the game and the other reason is the internet speed in certain areas or server down and playing the game will be lag, so that the student cannot play the game using internet connection.

2.2 Design Description

The design for the Serious Game consists of five important criteria, which are:

1. Login Page
 - Refer to figure 4, this page consists of username, password and category. This is where the medical students need to type in their username, password and select their category. The category part consists of student and admin. The username, password and category will be stored in the database.
2. Sign Up Page
 - Refer to figure 5, this is where the medical student needs to register their name, email address, username and password. All of this information will be stored in a database.
3. Forgot Password Page
 - Refer to figure 6, this part is sending the temporary password to the user's email box so that the user can get the temporary password for their system. In the main interface for the system, the user can change their temporary password and the system will ask the user to reset your own password. The user types their email address. The temporary password will be updated in the database and replace to their old password.
4. Change Password Page
 - Refer to figure 8, this part is change the password if the user wants to change their password. The user types their username and new password. The new password will be updated in the database and replace to their old password.
5. Main Interface Page
 - Physical Simulation Part

- i. Refer to figure 7, this part is to stimulate the 3D environment in the hospital. The user can use the keyboard and mouse to walk through the 3D hospital environment. The crowd simulation will be making the 3D hospital environment become more realistic. Firstly, the system will be started across the lobby. The user can control by using a keyboard. Next, the user will be walked to the patient and click on the patient. After that, it will come out one menu box and ask the user to select the chat and treatment part. If the user selects the chat, then the chatting part will pop out. However, if the user selects the treatment, the treatment part will come out.
- Chatting Part
 - i. Refer to figure 7, this is where the conversation between doctor and patient will be shown in this part. The user needs to type the related questions so that the system will be replied according to their questions, which are stored in the database. Therefore, this part is to understand the situation between the doctor and patient.
 - Treatment Part
 - i. Refer to figure 7, this part is to control the treatment from the patient. The user will be found the disease in the chatting part so that the user can understand the situation of the patient. Hence, the user can choose the appropriate treatment and medicine to the patient by using a drop box menu bar.

6. Admin Page

- Refer to figure 9, this page consists of four parts, which are to manage user, manage a patient and view logs.
 - i. Manage User Page
 - Refer to figure 10, this is where the admin can delete the user information. The database will be deleted the user information. Thus, there do not have any information about the user.

ii. Manage Patient Page

- Refer to figure 11, this is where the admin to create profiles of a patient, assigns patient and delete the patient profile. The patient profile contains name, age, gender and disease (refer to figure 12). The admin will assign the patient who is treating by the user (refer to figure 13). The admin can delete the patient information from the database (refer to figure 14).

iii. View Log Page

- Refer to figure 15, this is where the admin can view the patient information, chatting part and treatment part. Each user treats an own patients. Each patient contains patient information, chatting part and treatment part of the database.

Figure 4 Login Page

The image shows a login page interface within a window. The window has a close button (X) in the top right corner. The login form is contained within a rectangular border and includes the following elements:

- Username:** A text input field.
- Password:** A text input field.
- Forget Password?:** A text link centered below the password field.
- Category:** A dropdown menu with a downward arrow (V) on the right. The menu is open, showing two options: "Student" and "Admin".
- SIGN UP:** A button located at the bottom left of the form.
- LOG IN:** A button located at the bottom right of the form.

Figure 5 Sign up Page

The sign up page is enclosed in a window with a close button (X) in the top-left corner. The title "SIGN UP" is centered at the top, and a [BACK](#) link is in the top-right corner. The form contains five input fields: "Name*", "Username*", "Password*", "Confirm Password*", and "Email*", each with an asterisk indicating it is required. A "SIGN UP" button is located at the bottom right of the form area. A "*Required" label is positioned at the bottom left of the form area.

Figure 6 Forgot Password Page

The forgot password page is enclosed in a window with a close button (X) in the top-left corner. The title "Forgot Password" is centered at the top, and a [BACK](#) link is in the top-right corner. The form contains one input field labeled "Email". Below the input field are two buttons: "SUBMIT" and "CANCEL".

Figure 7 Main Interface Page

The main interface page is titled "SERIOUS GAME FOR INTERNAL MEDICAL" and includes links for "CHANGE PASSWORD" and "LOGOUT". It is divided into three main sections:

- Chatting Part:** Contains two speech bubble icons and a small input field at the bottom.
- Physical Simulation Part:** Contains buttons for "Chat" and "Treatment", and a diagram of a patient lying on a gurney with a sad face.
- Treatment Part:** Contains two dropdown menus, each with a downward arrow icon.

Figure 8 Change Password

The "Change Password" dialog box includes a "BACK" link and the following fields and buttons:

- Username:** Input field
- New Password:** Input field
- Confirm Password:** Input field
- SUBMIT:** Button
- CANCEL:** Button