BTECH 451 MID-YEAR REPORT

iSpyHorses.com

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ABSTRACT

This report describes all the information which is related to my BTECH 451 project up to June, 2015. The goal to finish this project is to build up an online community and a listing platform for international equestrians. All programming work are based on PHP and HTML language. Apart from coding, there is also involved in web server and hosting.

The first chapter introduces the detail of this project about the requirements and what am I going to achieve. There is also a section for the key people who are involved this project.

Chapter two gives a brief outline for all related knowledge for this project. All information separates to two part. One part introduces the tools and applications that need to be used for website hosting which another briefly describes the information of programming language.

Chapter three then provides the establishment of the system structure and an explanation about how the website processing. Some code is given in this section to help clarify the programming.

The following chapter, chapter four, looks at the main work I have done in the first semester. And chapter five points out the future work I will do for next few months.

The last chapter concludes this report and difficulties. The next achievement is going to finish this project in next semester. The last chapter is followed with the reference for this report.

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CHAPTER 1

PROJECT INTRODUCTION

This project is produced for completing the last year of the bachelor of technology in the University of Auckland. BTECH 451 is intended for the projects which are related to Information Technology. Normally it requires students to have real work experience with programming. This one-year-long project worth 45 points of study which equals to three papers of the university.

This project is involved with the development of iSpyHorses.com and supervised by Ulrich Speidel. All programming work are based on PHP, HTML, CSS, and JavaScript.

1.1 BACKGROUND OF ISPYHORSES.COM

The iSpyHorses.com is designed for the community of international equestrians. It works like an online-shopping system as well as a social networking service. There are four main parts of the website. The “I” in the name of iSpyHorses means the homophone of the eye.

- A listing platform that for sale where users can list whatever they wish to sell relating to equine.
- A news page where allow users and administers to post news of the horse world.
- A journey page for users that they can share their personal life and showcase their lovely horses.
- A connect page that people in the community are able to talk to each other.

The owner of this website spend a life-long time to work for horses and she then decided to do this equine-related website business. Although she has no computer science background, she is passionate about her job.

This website was half-developed by Latch Digital and Webpartners. The Latch Digital Company spent a half year to finish the fundamental framework and they then left the project before I joined in. The Webpartners spent another half year to continue to work on this project, but they did not manage to finish this project either. The Webpartners Company stopped to implement this work in April.

The framework of this system is developed by Latch Digital themselves instead of using common PHP frameworks. The developer who works for the Webpartners lives in overseas therefore it was quite hard to communicate with him as well. Both companies' developers left no documentation for the program.

Thus, I spent a big amount time to understand the foundation in the beginning.

1.2 PEOPLE INVOLVED

There are some people involved in this project, from both sides of the University of Auckland and iSpyHorses.

Ulrich Speidel: my academic supervisor for this project.

Sathiamoorthy Manoharan: the coordinator of the Bachelor of Technology (Information Technology).

Heather Cato: the owner of iSpyHorses who I work directly with.

CHAPTER 2

INTRODUCTION

This chapter provides simple explanations for all related tools and applications.

2.1 SERVER-SIDE

This website used to be hosted by Worldnet, but it has been moved to Optimus System now. Both companies are located in Auckland. Both of them provide high-efficiency service to maintain the server when a problem takes place. As well as taking daily care of the operation.

2.1.1 VIRTUAL PRIVATE SERVER

A virtual private server is used with Optimus System web hosting service while a physic server is used with Worldnet. Virtual private server is a virtual machine runs its own copy of an operating system [1]. Customers have the high priority to access to the operating system and can install almost any software that runs on that OS. A virtual private server is functionally equivalent to a dedicated physical server, but it is much more simply to create and configure. The price is lower than the physical server. However, the performance is lower than the physical server since it shares underlying physical hardware with other VPSs. A certain delay is detected with VPS during processing.

2.1.2 APACHE SERVER

The Apache server is the world's most widely used web server software [2]. The software can be used in the different operating system, including Linux, Windows,

FreeBSD, Solaris, OS X, Unix, NetWare, OS/2, TPF, OpenVMS, and eComStation. The Linux is the most common and popular operating system to use Apache server. In our case, we are using Linux as the operating system.

2.1.3 SMTP MAIL SERVER

Simple Mail Transfer Protocol (SMTP) is an Internet standard for electronic mail transmission. SMTP by default uses TCP port 25. It uses for sending and receiving emails to communicate with customers.

2.1.4 DATABASE SERVER

A database server provides database services to other computer programs or computers in client–server model. This can be described as a computer which is dedicated to run such a program. Database management systems regularly deliver the functionality of a database server. Some database management system such as MySQL rely entirely on the client–server model for database access.

Such a server can be accessed from a "front end" running on the user's computer which displays all tables and schemas of requested data and the "back end" which runs on the server and handles tasks such as data analysis and storage.

Most of the Database servers works with the base of Query language. Each Database understands its query language and converts it to Server readable form and executes it to retrieve the results [4]. Although every server uses its own query logic and structure, the SQL query language is quite similar in all relational database servers.

MySQL is used for this application.

2.1.5 CONTROL THE SERVER

2.1.5.1 SSH

Our Linux server has been provisioned with SSH access.

Secure Shell, or SSH, is a cryptographically encrypted network protocol which is used for remotely connecting machines or servers from another machine in a secure way.

This allows a user to remotely control a machine's command prompt. It also allows a user to establish a secure channel over an insecure network in a client-server architecture, connecting an SSH client application with an SSH server [4]. Normally a remote command-line login is required.

2.1.5.2 PuTTY

PuTTY is a free implementation of Telnet and SSH for Windows and Unix platforms, along with an xterm terminal emulator. It is written and maintained primarily by Simon Tatham [5]. PuTTY is used to SSH to the server machine with command prompt.

2.1.5.3 FileZilla

FileZilla, a cross-platform FTP, SFTP, and FTPS client with an enormous list of features, supports Windows, Mac OS X, Linux, and more. We use FileZilla to transfer files between the local machine and the server. It allows comparison of files and efficient synchronism.

2.1.5.4 Plesk

Plesk software package is a commercial web hosting automation program. It is a web control panel for hosting website. It allows to control the server through a web-based interface. All file transformation or database management can be done with Plesk. Moreover, setting up email accounts and manage DNS are also available.

2.1.5.5 SVN Repository

Subversion is a free/open source version control system. That is, Subversion manages files and directories, and records the changes of files. This allows to recover older versions of data or examine the history of how data changed [5].

There are two people work on iSpyHorses.com now. Subversion can make sure us two do not overwrite each other's work. It helps us save time in comparison and data loss.

2. 1.6 LOCALHOST

To work more efficiently with web development without update the code to the server each time. A localhost server has been set in my local computer to develop the website. XAMPP is an Apache distribution which contains all requires for PHP development, such as MySQL, PHP, and Perl.

2.2 WEB APPLICATION

2.2.1 PHP

The iSpyHorses.com is based on PHP language. Hypertext Preprocessor (PHP) is a server-side scripting language which is designed for web applications. It is very popular in web development as well.

PHP program is easy to work with HTML code. It also can be used with different template engines and web frameworks. PHP code is usually processed by a PHP interpreter, which is usually implemented as a web server's native module or a

Common Gateway Interface (CGI) executable [7]. The PHP code can produce a readable webpage after interpretation and execution.

2.2.2 MySQL

MySQL is a widely used relational database management system and open-source RDBMS. The SQL shortening stands for Structured Query Language.

In addition, MySQL is frequently used for web applications. Free-software-open source projects that require a full-featured database management system often use MySQL. As well as many high-profile, large-scale websites.

2.2.3 HTML

HyperText Markup Language is the standard markup language used to construct web pages. Web browsers read HTML files and display visible or audible web pages. Browsers translate HTML tags and scripts to present the content.

2.2.4 CSS

Cascading Style Sheets (CSS) is a style sheet language used for formatting a webpage. The language can be applied to any kind of XML document to perform a styled output.

2.2.5 JQuery and JaveScript

JavaScript is a scripting language that was designed for use in website development. It has been used for server-side programming, game development, and even creating desktop applications [8].

JQuery is simply a specific library of JavaScript code. It is the most common library for web applications because it is easy to use and extremely powerful.

It is noteworthy that both JavaScript and jQuery are both JavaScript while many people confuse them as two different scripting language. The difference is that jQuery has been optimized to perform many common scripting functions with less coding work.

JavaScript allows developers to show some different actions for webpage, such as animations, event handler.

2.2.6 FRAMEWORK

A web application framework supports the development of dynamic websites, web applications, web services and web resources. The framework aims to improve the overhead associated with common activities performed in web development. For example, many frameworks provide libraries for database access, template frameworks, and session management, and they often promote code reuse. Therefore, developers can easily code with existing stable and powerful structure.

CHAPTER 3

PROGRAM STRUCTURE

This chapter describes the programming structure of iSpyHorses in order to introduce the main operation of this system. Although the framework of this website is developed by previous developer, some fundamental work are based on Symfony.

3.1 MAIN MODULES

Firstly I will introduce the main components in the web application layer. Each of them play a different role to process this website.

3.1.1 VIEW

A folder which is called View contains all the html files to manage the layout and presentation of iSpyHorses.

3.1.2 ASSETS

This folder contains all stylesheets and JavaScript files to format the website. Furthermore, it stores the pictures that is updated by users.

3.1.2 MODEL

PHP classes are written in this folder that to connect and to query the database.

3.1.3 CONTROLLER

PHP classes in this folder are controlling the communication of database and webpage.

3.2 FRAMEWORK

3.2.1 TWIG

Twig is a template engine for PHP.A handbook which is given by [9] has explained how twig works. I will discuss more details later.

3.2.2 APERTURE-CORE FOLDER

The fundamental work is defined in this folder. Four main php files control the process of calling files in core structure.

- apertureControl.php
  Define the classes in Control folder to load model classes and html pages. As well as mailing functions.
- apertureModel.php
  Define the classes in Model folder.
- apertureEndpoint.php
  Define the path of HTML files.
- apertureRoutes.php
  Define the way to read routing file.

3.2.3 APERTURE.PHP AND APERTURE.JSON

The environment of the server and the website is set in aperture.json file. When browser reads the index.php file which requires aperture.php check the environment with aperture.json. If the environment matches then start to process the website by calling routing files.

More details will be given in next section.

3.3 PROCESSING

This section will explain the processing with example code.

3.3.1 ROUTE.PHP

```
route('GET /index', $this->to("index", "index"));
```

In route.php, urls are read like above. This means a path with /index executes indexcontroller.php (the first index inside bracket)'s index() function(the second index).

3.3.2 INDEXCONTROLLER.PHP

```
public function indexAction() {
    $focus = Profile::getInFocus(4);
    $highlights = Highlight::getHome();
    $horses = Horse::getFeatured(6, 1, 'rand()', 'feature = 1');
    $slides = Horse::getFeatured(6, 1, 'rand()', 'superfeature = 1');

    echo $this->view("index/index.html", array(
        'slides' => $slides,
        'highlights' => $highlights,
        'focus' => $focus,
        'horses' => $horses
    ));
}
```

Variables are read from Model file. For example, Horse.php return values for the variable horses. The view method was defined in apertureController.php which outputs horses' value to index.html.

3.3.3 MODEL/HORSE.PHP

```
static function getFeatured($limit = 6, $page = 1, $order = 'id desc', $type = 'feature = 1 or superfeature = 1') {
    $extraConditions = array(
        'and (' . $type . ') and expiry_date > now() and is_slider=1'
    );
    return self::search($extraConditions, $limit, $page, $order);
}
```

Horse.php then query the database to return the values to controller file.

3.3.4 *INDEX.HTML*

```
{% for horse in horses %}
<div class="horsepic">

<a href="{{horse.link()}}"><img width="100%" src="{{horse.image()}}" /></a>
<p>{{horse.name}}</p>
</div>
{% endfor %}
```

Twig applied to html file to read the database value from controller file. In the webpage this would output the name, link, and image of all the horses from query.

CHAPTER 4

CURRENT WORK

This chapter presents all the work I have done with iSpyHorses.com up to June, 2015. Although the website was 70 percent finished when I joined in, I was the only developer who worked on this project from early April to later May. The main problem to me in the beginning was to understand the entire system which was established by previous developers. It was not easy to me in early days since there was no documentation or comment left in the code.

The major achievements of the first semester are understanding of the application and communication with the owner. In meanwhile, implemented some functions to the website.

4.1 OVERALL LAYOUT

The first job was to change the overall layout from an entirely different design to another. I implemented my own CSS stylesheet to modify the performance. To make the website responsive to different screen size, viewport size and percentage width are widely used in this stylesheet. Float and overflow properties are also quite important to format the website.

I have noticed that some styles cannot exactly match the design because it is not only the stylesheet issue. It also related to functions behind the code. Consequently, some parts of the design seem like hard or even impossible to plug-in.

There was another problem with the design was that the design comes after development. And the designer has not communicated with developers before he output the layout.

Thus, many functions are not in the application but it required by the design.

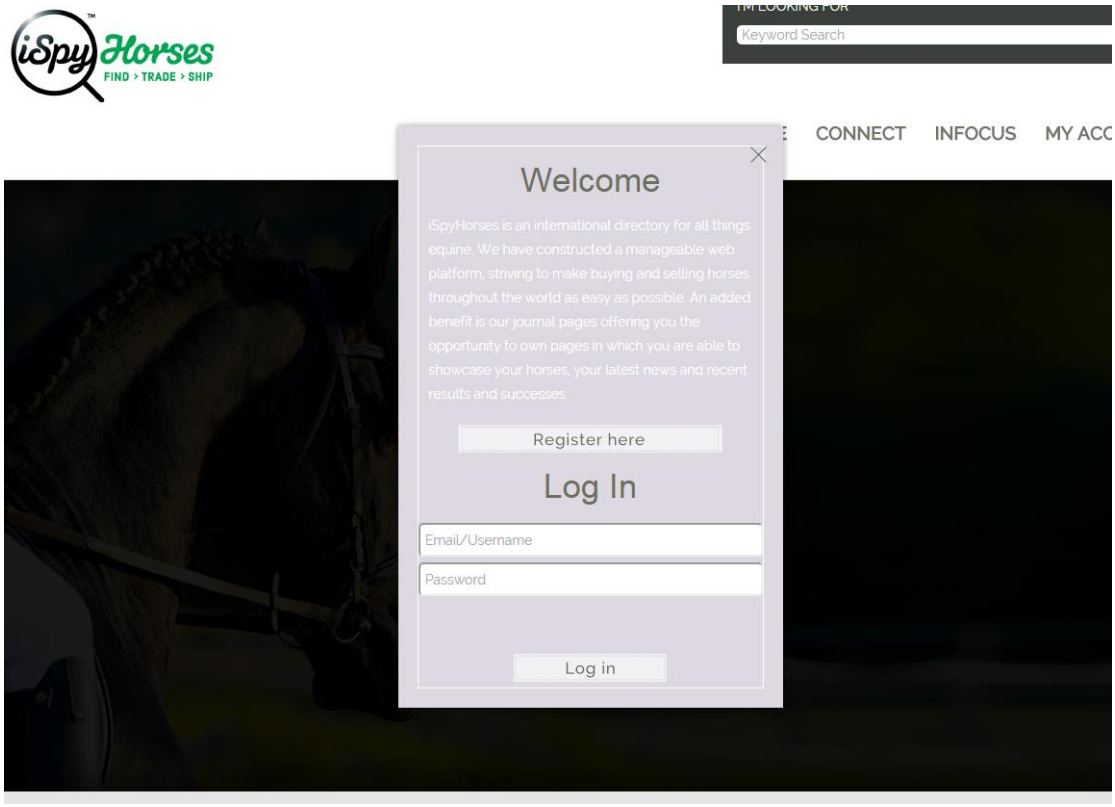
Heather also had changed her mind for the layout part several times. Therefore it took quite long to finish it. This performance of this website mainly targets at PC for resolutions greater than 1280px. All styles have been tested.

4.2 JAVASCRIPT AND JQUERY

Some JavaScript files and JQuery files have also changed or added when apply the new design to the website. The picture 4.2.1 below shows the current layout of homepage while picture 4.2.2 is an example of the pop-up window.

- In the homepage, the design requires a section for a set of slide banner pictures and a carousel show for members' listings.
- A pop-up window without address bar or title bar, is also called modal window, is requested to load a log-in page and some form functions. Moreover, the log-in page pop up automatically when the page is loaded.
- Some DIVs need to be hidden when a click event occurs.

PICTURE 4.2.1



PICTURE 4.2.2

4.3 DATABASE

There were some functions of the website did not work because some variables in the controller file read the non-existed value from the database.

Also, some values are linked into a specific ID as a default value in the database. Therefore, every time to submit a form function, there is a default value for such table.

Most of work to do with the database that to clean up all the useless schema either related or not related to model and controller files. This website has changed lots of functions during development, hence, there were lots of redundant schemas in the database. As well as some expired listings which were created for testing listing functions.

4.3 SET UP THE SERVER

iSpyHorses.com has changed server once during development. The new one is VPS which is hosted by Optimus System.

I do not have too much server related knowledge in the beginning, but I helped to choose the one that we needed.

Most configurations are done by Optimus, but it was my job to connect the website and the server. Many problems happened in the first time to update the application to the server. The environment of mail server and database has changed due to change of website hosting. I create a new database in the new one in order to produce further development with this server.

SMTP are registered with ispyhorse.com domain. Therefore, I have connected the domain to the provided IP address. Heather does not want the website to go public before everything finish. Therefore, an htpassword file for authorization access has been produced for security.

It was quite important to connect the domain name to the server because the register function is using the mail server to send new members a confirmation email.

4.4 FORM FUNCTION OF PHP

The listing platform is the main goal of iSpyHorses.com. Same as trademe, it allows users to sell their products online, but iSpyHorses are only focused on equine. I have developed one category of listing to the application.

To complete the listing program, several classes need to be modified and added.

- The router.php file

  Add a get and a post calling for server calls the control when a page is loaded.
- Add controller file

  This controller file will manage the methods which one shows where.

- Add model file

  This one to store data to databases as well as query database which required by controller file.

- The HTML file

  This one is for human eyes to read the website. Listing functions are stored in modal window therefore it's connected to JavaScript as well.

An example has given in the earlier discussion. My implementation follows the process to add more functions to this application.

At the same time, I also did some bug-fixing work to maintaining the website.

CHAPTER 5

FUTURE WORK

This website is 85% percent finished now. But there will be more if Heather, the owner, wants more section. For example, a forum.

We have discussed it, but Heather changed her mind afterward. Therefore, the forum is not needed for now but maybe after this website goes live. We then need to work on this if heather changed her mind again.

5.1 ADMIN

Letting administer to control the website without worry about any code is the proposal of admin part. In this page, admin should be able to

- See all the listings which made by users and edit or delete it.
- See all the news which is submitted by a user. The user should be aware that the news goes to admin first then go to the public page.
- Control the banner pictures. The banner pictures will change for a certain time. Administer can edit this part without change the code.

5.2 WEBSITE-WIDE SEARCH

There are search functions for each individual section already. This means users can search news in news page or search listings in listing page. But Let people to search the whole website is the requirement. This means if a user enters "test" in the search bar, the website will return all values that contain the keyword. It can be listings, news, status, or even members who have "test" in their name.

5.3 A Communication Page

A page that works like a message board or a simply vision of Facebook for each individual users. Users can follow other users and go to their communication page to leave a message. Users are able to post stories and pictures in their own page or other people's page. In addition, users can comment in each single post.

5.4 Mobile-Friendly Layout

Google indicated that the search result shows mobile-ready website first in google search. The mobile-friendly layout are getting more important for web development.

5.5 Performance Testing and Go Public

This website is developing without having any performance testing yet.

It could be a major problem if the framework is unstable when the website is going to public. There will be more bugs and problems occur.

A performance testing for this website seems quite important in the stage before public ispyHorses.com.

CHAPTER 6

CONCLUSION

Up to now this project works under control. The main goal in the first half semester was to understand the processing of the framework. I then started to contribute my own work to implement the website after Easter. I have learnt a lot more than just programming from this project. For instance, the communication skills with people from all different view of this project. I am glad that I have achieved some progress for this project at the end of first semester.

In the beginning I had some difficulties to understand the real ambition of iSpyHorses because I got confused with the “journey” and “connect” pages which are required by the owner. And the owner was going to start everything from very beginning in the middle of my processing. Glad we did not. I have noticed that the objective of this project is not enormous hard to achieve, but it requires more effort to make the website perfect. I will focus more on the functionality of the website from now in order to finish all the unfinished parts of the project.

The maintenance of the website in the first few weeks, when it goes public, would also be very worried. In remaining time I will complete all tasks and fix all possible bugs with this website in order to finish my project.

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