**CHAPTER 2**

**LITERATURE REVIEW**

1. **Web Application**

Web application is a client-server application that uses web browser as its client program, which delivers interactive services through web servers distributed over the internet or intranet (Shklar & Rosen, 2009, p. 11). While a website can only delivers content from static files, a web application can present dynamically tailored content based on request parameters, tracked user behaviors, and security consideration.

In the recent years, web applications have become more popular compared to offline application due to some benefits it offers that fit the current needs of society. According to Fowler and Stanwick (2004), the benefits of creating a web-based application includes:

* Web application can provide rich information resources. On the internet there are many resources and libraries that can be easily included within the application. Help for web application can also be more easily updated and delivered through internet.
* The internet provides a level of collaboration and communication. There are many communication platforms that can be implemented within web application, for example e-mail.
* A very useful hybridization is possible. With the use of internet, the web-application can connect and make use of other already existing application or platform, such as skype and paypal.
* Applications don’t have to be compiled to run. When using Java, Javascript, HTML, or XML, the code doesn’t have to be compiled to see if it works. Developers just need to run it on their browser which is much more efficient.
* Applications delivered through a browser that doesn’t have to be installed on individual computers. To use a web-application, users can just easily open browser, which is certainly available within all computers, and type in the web address.
* Browser-based applications are portable, even mobile. Aside the fact that it can be opened through computers, it can also be opened easily through mobile browser, which means more accessibility for everyone.
* The web is international. Instead of being forced to distribute copies of databases throughout the world and update all each evening, developers only need to maintain a single central database.

However, whilst developing web-application, there are some factors that need to be considered, as stated by Fowler and Stanwick (2004), such as:

* Performance can be slow. Content with large size and checking input immediately may cause major performance hits.
* Browser incompatibilities and extensibility issues may appear. Things won’t act the same on different browser. Developers have to make sure that the web application will still be user-friendly even on different browsers.
* Network failure may be a risk. If the network is incapacitated because of spam attacks, equipments breakdowns, configuration mistakes, or other problems, everyone that uses the application will be directly affected.
* Security is more of a concern. Anytime the server is open to the outside, there is a risk that unauthorized people might get into the system.

These drawbacks can be easily evaded if the design, development and maintenance of the web applications are done properly.

1. **CodeIgniter**

CodeIgniter is a free, lightweight, and simple to install framework that can help the development of php-based website developed by EllisLab. Developing a website using framework, specifically CodeIgniter, will reduce the amount of code that needs to be typed, and makes the script easier to read and update, aside from giving the website a coherent structure (Upton, 2007). Using framework will simplify the coding of repetitive operations, making the website to be more robust. For developing a web-application that has various features, CodeIgniter will come in handy, as many of the library and helper contains a great functionality for coding process.

CodeIgniter uses MVC (Model View Controller) software development design pattern, which divides the application into three segments: models (database abstraction layer), view (front end layer), and controller (application logic layer). CodeIgniter also use singleton design pattern where if a class is loaded multiple time, the same instance of class will be returned (Upton, 2007).

1. **Twitter Bootstrap**

Twitter Bootstrap is a CSS and Javascript based framework for UI. It offers a number of new enhancements towards web development such as a responsive layout which adapted to desktops, tablets, and handhelds (Cochran, 2012). Twitter Bootstrap helps developers to achieve a balanced layout of elements and color harmony by providing standard grid sizes and page layout tools, and also set of base CSS rules (Young, 2016). Applying bootstrap to web is very easy and simple as developers only have to add suitable class name provided by bootstrap to the corresponding html elements.

1. **Responsive Web Design with JQuery**

Many developers find it challenging to create different versions of web applications for various types of devices, for example, different mobile phones which now have varied different mobile screen size. However, with a content design method called responsive web design, only a single web-app design will be required to be able to be compiled on those different devices. The website will only need to be set up on a standardized resolution and the standardized resolution will later be adequate for almost all purposes. However, a resolution that looks nice on all device must also be accompanied with a good user experience across all device. The fact that different devices have different capability and used in different occasions needs to be taken in consideration whilst making a responsive web design, to ensure a pleasant user experience for all kind of device user.

Responsive design can be made possible with the existence of flexible grid based layout, flexible images and media, and CSS media queries. Javascript as one of well-known language used on web development is able to bring the capability of feature detection on web browser. JQuery on the other hand, is a free and comprehensive framework built on top of JavaScript language. The framework provides series of useful functionalities to build an interactive and responsive web-app, such as AJAX support, expanded event system, ability to use DOM (document object model) and free plugins. AJAX is often used to ensure a reaction of web-app in an almost real-time manner whilst new data is requested by the web server, making an interactive design possible.

1. **HTML 5 Geolocation**

Geolocation can be defined as the act to identify the position of certain object or location. These days, the location can be easily found on different devices and now has been applied to various applications. In the past the geolocation function can only be applied on distinctive devices, but now thanks to the technology development, it is possible to write geolocation applications for the web directly in the browser. One of the options that can be practiced is W3C Geolocation API. Geolocation API is generally a series of simple JavaScript calls that retrieve latitude and longitude, altitude, accuracy of latitude and longitude, and altitude information, heading, and speed of the attached device. However, different devices have different technical capabilities, not all these value will always be available to be presented on the device.

Geolocation is expected to keep on developing in the future as more and more device is proven to be supporting the application of geolocation. Many applications also have used geolocation as one of its main functionality and backbone of business ideas.

1. **PHP (Hypertext Processor)**

**PHP and MySQL Development: Second Edition by Luke Welling and Laura Thomson**

PHP is an open-source scripting language that is designed specifically for website development. It can be embedded within an HTML page and interpreted at the Web server to generate a certain output to the web page. PHP is also known for its versatility since it can work well with many Web server software such as Microsoft Windows, and Unix.

PHP code begins with *<?php* and ended with *?>*, which means that any text between the tags will be considered as PHP code.

**HTML 5**

**Responsive Web Design with HTML5 and CSS3 by Ben Frain**

During the past years, websites could be built at a fixed width for there is an expectation that end users will have a fairly constant experience. However, the fact that nowadays various number of screen resolution grows rapidly, not to mention the coexistence of smartphone who has small screen resolution, making it more difficult to decide which size that will suit the best for everyone.

HTML 5 features a responsive web design that allows a website to fit across multiple devices and screens. In addition, it also emphasizes on the actual markup required to create our website not only responds to a specific viewport but also load in the fastest possible time. Further, HTML 5 offers more benefits over the previous iterations of HTML such as new semantic elements and interactive feedback to user while submitting forms. This will decrease the amount of heavy resource like JavaScript form validation and enabling developers to create leaner and faster-loading code base.

**CSS3**

**Responsive Web Design with HTML5 and CSS3 by Ben Frain**

CascadingStyleSheets (CSS) were introduced as a way of separating design from the content. It consists of a number of built-in modules that make a web page design highly customizable.

Ever since the wide variety of screen resolution were introduced, developers could no longer built a website with a fixed width. One of CSS3 modules called Media queries allow developers to target specific CSS styles depending upon display capabilities of a device.

**UML Diagrams**

**Software Engineering A Practitioner’s Approach**

UML or Unified Modelling Language has become the most widely used notation for analysis and design modelling. It offers robust notation for the modelling and development of Object Oriented systems.

UML Diagrams are used to illustrate important analysis and design methods for both conventional software and web applications.

**JavaScript**

**JavaScript: The Good Parts: The Good Parts by Douglas Crockford**

JavaScript is one of the most popular programming languages for it associates well with web browser in order to provide some powerful functionalities for a webpage. It suffers from the API of the browser, the poorly specified and inconsistent implementation of the Document Object Model (DOM) and the usage of global variables for linkage.

Despite of all the drawbacks, JavaScript features several good ideas including loose typing, dynamic objects, and an expressive object literal notation.

**Agile Development**

Agile software engineering is a combination of a philosophy and a set of development guidelines that encompasses customer satisfaction through incremental delivery of software. The engineering is performed by a small number but highly motivated project team that focus on maintaining continuous communication with the customers.

The tendency to transform into agile development have grown significantly because of the modern business environment that forces computer-based systems and software products to be delivered quickly and ever-changing. This means developers must be agile enough to respond a fluid business environment. However, fluidity is expensive especially if it is uncontrolled and poorly managed.

**REFERENCE**

Fowler, S.L, Stanwick, V. (2004). *Web Application Design Handbook: Best Practices for Web-based Software.* San Fransisco: Morgan Kaufmann.

Holdener, A.T. (2011). *HTML5 Geolocation.* O’Reilly Media, Inc.

Patel, S.K. (2014). *Developing Responsive Web Applications with AJAX and jQuery.* Packt Publishing Ltd.

Purewal, S. (2014). *Learning Web App Development:*. Sebastopol: O'Reilly.

Rouse, M. (2011). *Web Application (Web App)*. SearchSoftwareQuality. Retrieved from <http://searchsoftwarequality.techtarget.com/definition/Web-application-Web-app>

Steyer, R. (2013). *A Hands-on Guide to Building Rich Interactive Web Front Ends.* Addison Wesley.

Upton, D. (2007). *CodeIgniter for Rapid Php Application Development.* Olton: Packt Publishing Ltd.

Werdmuller, B. (2013). *Instant HTML5 Geolocation How-To.* Packt Publishing Ltd.