

Redesigning of PefaMall™: The E-commerce Website

Thang Yee Na¹, John Liu², Sobihatun Nur Abdul Salam¹ and Ariffin Abdul Mutalib¹

¹Universiti Utara Malaysia, Malaysia, {enayee@gmail.com, sobihatun@uum.edu.my, am.ariffin@uum.edu.my}

²Grace Information Blockchain Co. Ltd, Taiwan, {john.liu@git4u.com}

ABSTRACT

The main purpose of this study is to redesign an e-commerce website, PefaMall™ by PefaMall Holding Ltd. The original website was running slow when taking the data from the server. Furthermore, the current framework of the website is combined with front-end and back-end side, which was not systematic enough to modify or maintenance. This study has improved the website by redesigning the interface through chosen technologies and hence improve the user's satisfaction. Through waterfall methodology, the website was redesigned and several conditions on interface were solved.

Keywords: E-commerce website, redesign, interface, front-end development.

I INTRODUCTION

Website is a collection of connected pages on the World Wide Web (WWW) which contains information in the form of Hypertext Markup Language (HTML). The website are connected to the web server through internet protocol for instance internet, local area network (LAN) or intranet, and can be able to browse with uniform resource locators (URL) that identifies the pages (Raselk, 2016). The interactive website consists of various multimedia elements, which users can interact with interfaces that combined with those elements.

PefaMall™, which is an e-commerce website that owned by PefaMall Holding Ltd, which provides a platform to different distributors to put products and organization's member can buy items with accumulated points. The website of Pefamall™ is currently located in <https://www.pefamall.com/>. The study is focused on improving the interface and improve the user-experience to browse the website.

This primary goal of this study is to redesign the PefaMall™ website so that it will generate higher benefits for the user. Changing front-end framework, improve website interface and take over maintenance is used as alternative in the upgrading process. It is also to analyze the perception of user toward upgraded website with concerning advantages and disadvantage. Satisfaction and behaviour also are the focus point in analysing user perception.

By redesign the PefaMall™ website, the new interface of the website was made by referring and making improvement from the original website. The functions of the operation were retained and improved by modifying minor actions for better browsing experience.

The technology used to develop for the front-end is single-page application (SPA). SPA is a website application that communicate with the users by dynamically and rewriting the current page instead of loading entire new pages from a server. In SPA, either all the necessary code and script is retrieved with a single page load, or the resources are land added dynamically to the page as necessary by user actions' response (Flanagan, 2006). By doing this, the application no need to have extra queries to the server to download pages and it made the website more user friendly to browse.

II METHODOLOGY

The methodology of this study is adapted from Waterfall model in Software Development Life Cycle (SDLC). Waterfall model is a development process which follow the sequence to manage progresses through a list of stages (Bassil, 2012). For this project, four phases were created and done which were study requirement, analysis and design, development and implementation, and testing and evaluation as shown in Figure 1. This method was chosen because it consists several phases that need to be completed before moving to next phase. By these method, the phases can be done in perfect condition. So, it was judged as suitable methodology model for this study to put forward new requirement during development process.

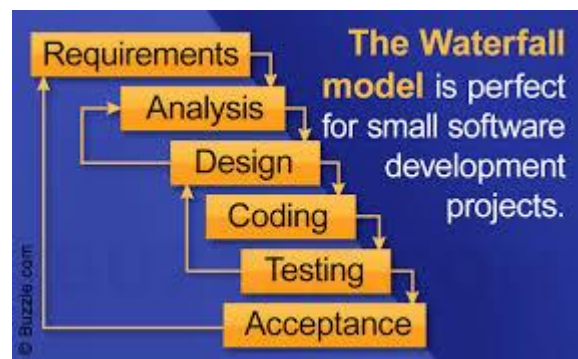


Figure 1. Methodology of Waterfall Model.

A. Phase 1: Study Requirement

Firstly, a study planning was conducted. Primary requirements from the client was received by the study manager. While the development team read through the original website and its scripts, they conducted several discussions to plan the system improvement. A planning for technologies, software and platforms used in this study was determined and a requirement list that ready to analyse was produced.

During the development process, all the scripts was written in a source code editor named Visual Studio Code. Visual Studio Code supports debugging, embedded git control, syntax highlighting and more features that frequently used during the development process. It is a lightweight code editor that has nearly full-featured that suitable to use on any operating system (Sam, 2015).

The study was updated by every team member to GitLab and the versions was controlled with Git. Git is a version control system to track the changes of study and scripts to work on among development team. It is primarily to the source code management in applications (Scopatz, Anthony; Huff, Kathryn D.,2015).

GitLab is one of the user-friendly platforms that under Git to store codes and files online. By GitLab, the study was able to develop in a team. The development team handled on different parts at the same time, then upload to GitLab then merge together. This saved a lot of time. Whenever developers add or modify the system code, they should have recorded the changes when committing to GitLab. By doing this, the development history was traced. The issues and minor requirements can be stated in GitLab too.

As one of the convenient prototype platform, Zeplin allows interface designer upload the prototype to online. Zeplin offers a variety of information, such as the size of the object, color code and the distance between two components in pixel to developers to create the interface. The developers can even download icons or images in prototype as Scalable Vector Graphics (SVG) format directly from Zeplin. It fastens the development process.

B. Phase 2: Analysis and Design

The requirements were analysed and divided into several parts according to its function. At this phase, tasks assignments distributed by the study manager to every team member to let the team member read through the information of their own part and ready for the development. The development team analysed the system and determined the method of improvement. A list of tasks and its description then created.

The new interface of the website was designed by interface design team depend on requirements, referring to the original website. The prototypes were delivered by interface design team to Zeplin. To convenient the development process, front-end development team referred to Swagger, which is a simulator to perform an action that can connect to the server. The interface design team and back-end development team cooperate together with front-end development team and lead by the study manager to complete interface and API design. A series of high-fidelity prototypes was produced at this phase. When all documents are ready, the building phase was proceeded.

C. Phase 3: Development and Implementation

At the building phase, the website was redesigned with the selected technique and framework. The frontend development team was built website interfaces and connect the action to the server with APIs that created by backend development team. While back-end development team was imported the data from original website to new server. For front-end development, all codes and scripts was built with HTML5, Cascading Style Sheets 3 (CSS3) and JavaScript (JS). In this phase, each team was conducted a lot of communication to handle unexpected condition or discuss the devnt details. The system published to test server for testing. After the development process is nearly complete, several tests were conducted.

D. Redesigned Interface of PefaMall™ Website

The interface of PefaMall™ had been improved by re-designing the interface and fix some mistakes that appeared in previous website.

Firstly, the navigation bar of PefaMall™ had been fixed. As shown in Figure 2, the second line of category list of the previous website was blocked by the content part. It troubled the users to select the category. The improved navigation bar was extended to fix the second line of category list as shown in Figure 3. Besides that, customer service element was added at the right-hand side of the improved website so that the users can contact with customer service department with easier way. Button to lead the page to top and navigate to shopping cart were placed at bottom right of the page.



Figure 2. Previous Main Page of PefaMall™.

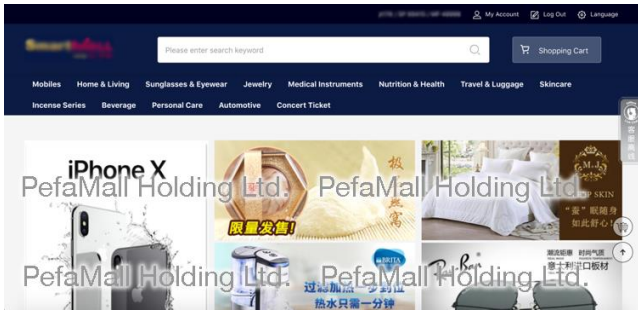


Figure 3. Improved Main Page of PefaMall™.

Besides, in the previous website of PefaMall™ as shown in Figure 4, the order list was shown in total with shipping status as filter. If the number of order was too much, user need to search for the specific order to look up the details. In the improved order page of PefaMall™ as shown in Figure 5, a pagination bar was added below to show ten orders in a time, and users can navigate to the page they want. Moreover, user can also choose to collapse the order page to show the member centre list as shown in Figure 6.

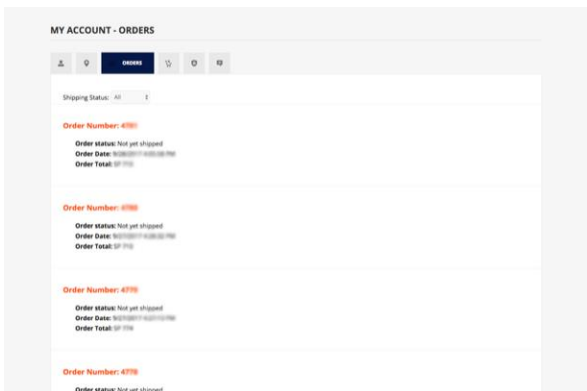


Figure 4. Previous Order Page of PefaMall™

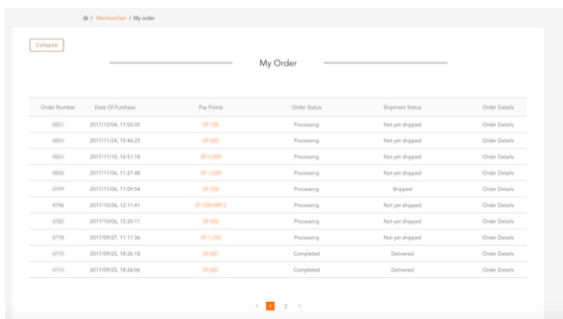


Figure 5. Improved Order Page of PefaMall™

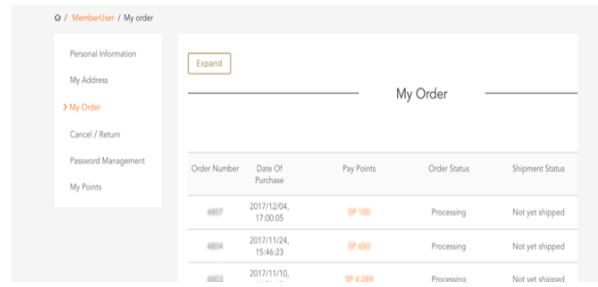


Figure 6. Improved Order Page of PefaMall™ in Collapse Mode.

In order detail part, the previous website of PefaMall™ had shown all the detail of the order and its shipment details as shown in Figure 7. As one of the request from owner of the website, the details had been separated to two different pages which was order detail page and shipment which shown in Figure 8 and Figure 9. More detail was added in shipment page as one order could have several different shipments.

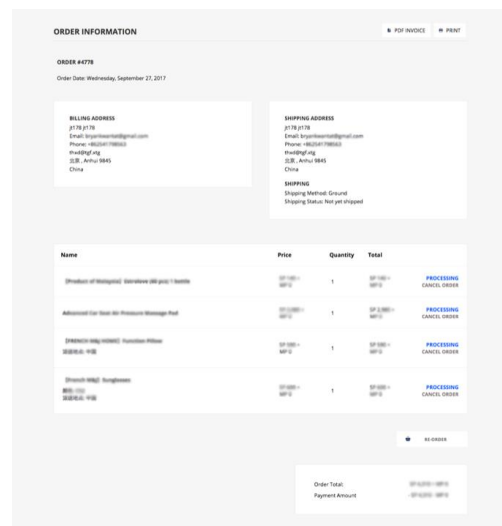


Figure 7. Previous Order Detail Page of PefaMall.

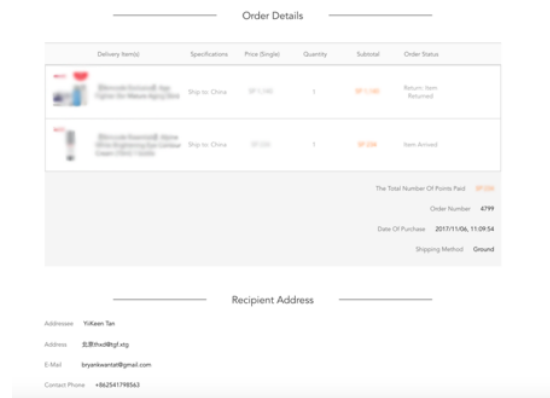


Figure 8. Improved Order Detail Page of PefaMall™

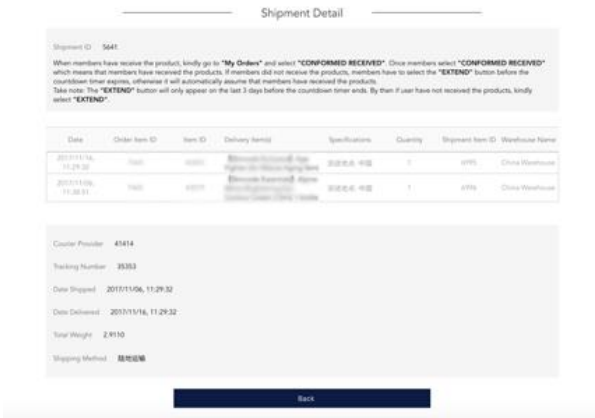


Figure 9. Improved Shipment Page of PefaMall™.

The previous address page of PefaMall™ as shown in Figure 10 had been improved to the interface in Figure 12. The columns of address detail were moved to center of the page and enlarged. The left-hand side of the page was added the member center list. Besides that, the breadcrumb was also added above the member center list to let the user able to navigate the member center easier.

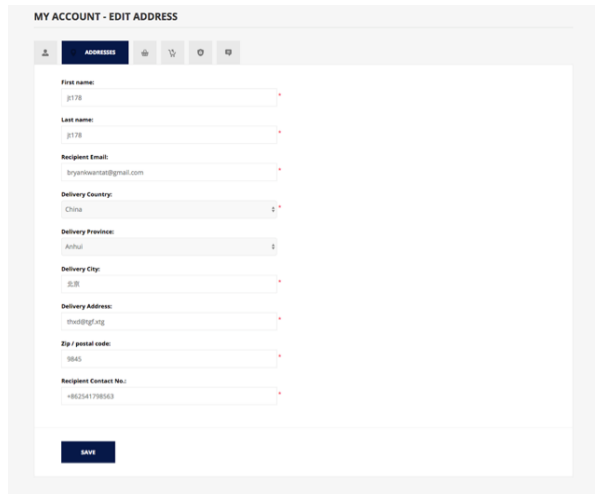


Figure 10. Previous Address Page of PefaMall™

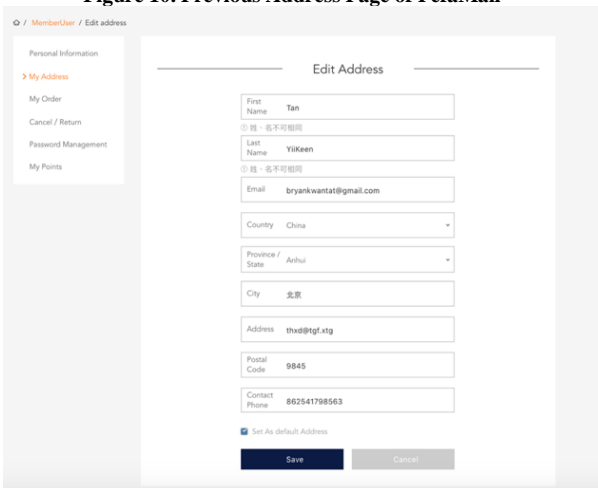


Figure 11. Improved Address Page of PefaMall™

E. Phase 4: Testing and Evaluation

System analyst team conducted unit tests on every action for any condition. They used the website behave like a normal user. Besides that, any new details that can improve the website by study manager or client also listed as requirements. When there are abnormal condition or error found, the condition listed as is, and specific team member who handle that part solved the issue.

When most of the issues are fixed, the study manager brought the new website to review by the client. When the client accepts the new website, upgrade of study was completed.

F. Result of Testing

In the testing phase, the system analyst team were the respondents to test the improved website of PefaMall™. They got a list of user activities such as put items into shopping cart, place order with payment, make actions to the ordered products and so on. The conditions or issues they met were listed down and pass to the development team to solve. Some of the major issues was met in this phase.

In the shopping cart and order placing procedure, miscalculating of total amount that need to pay was found. The issue was caused by the duplicate calculation by back-end and front-end, and this solved by remove the calculation in front-end development.

Besides that, the shipment fee issue was met because the complexity of shipment fee distribution by the distributor and customer. Study manager was discussed with the website owner to solve this issue.

In the Address Page, the nested area and state display issue was found by the system analyst team. It was because of the logical of displaying the area was different with previous page. For example, the area list was shown depend on the selected state. To solve this, front-end developer need to take the selected state to call the area list correctly.

Furthermore, the Time Zone miscalculation was met by most of the page with recorded time that take from database. It was because that the recorded time from database had already convert to the local time zone of Taiwan (UTC+08:00). Yet when the development process, the recorded time was converted again to local time zone of user. After discuss with the owner of website, the time zone was decided to follow the database version. So the front-end developer had to initialize the time zone to avoid the multiple calculation of the recorded time.

III CONCLUSION

By completing PefaMallTM website redesign, the aims to improving the website application had achieved. By identifying the problems occur in original website which were maintenance difficulty and client's request on changes of minor features, some recent technologies were used to rebuilt the website. By waterfall model as methodology, several iterations was proceed and every member of development team handled their own parts to develop and fix the occurring issues. Although the redesign phase was completed with minor problems, the company and development team are having progressive space and suggestion to grow and improve in future.

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