

E-Portfolio for Studio Based Design Learning of Architecture Students

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Abstract. Design learning is a paradigm, pedagogy or environment. It is a method and practice of teaching as an academic subject or theoretical concept. Design learning consists of a process propose, critique and iterate which will always be used during designing. It is a compulsory learning sequence for architecture students. Currently, there is a learning system which is E-Learning provided by UTM, does not help much in supporting the design learning. This is because most of the features in E-Learning system is designed for lecture-based teaching. The lecturers use the E-Learning to upload materials, lectures or topics every week. Meanwhile, students could refer and used uploaded files given. However, the way of architectural students' learning process is very different. From the starting until the end of the project, most of the processes related include getting and sharing information, designing and getting feedbacks for every process they did during completing the project. As a result, E-Portfolio for Studio Based Design Learning of Architecture Students is proposed to support students and lecturers of Architecture of University Technology Malaysia (UTM) on their design learning in a studio-based learning environment. This system is intended to help them by providing collaborating platform to communicate and share information related with their field. For the development of this system, the programming language that used is PHP by using Laravel framework and the software architecture used is model-view-controller. The methodology for this system is Rational Unified Process (RUP) that uses concept of iterative and incremental development.

Keywords: Design learning, studio-based, Laravel PHP, E-Portfolio.

1 Introduction

In 21st century, a new world with the high usage of information and technology has begin. Creative, intelligent and innovative creators have created variety of useful technology to assist people in their daily need. In IT web based approach, especially Web 2.0, has played a big role. "Web 2.0 allows user to interact and collaborate with each other in a social media dialogue as creator of user-generated content in a virtual community" (Thanuskode, 2011). It had helped people to share information through many ways such as blogs, discussions, online learning, multimedia and online assessment. The advancement of web has affected in design field too. It gives opportunity in design field to be more flexible by involving in a virtual environment. Design field is vast and usually design is related to architecture fields. In architecture, to get a best design, we need great ideas. The ideas usually come from observation, references and collaboration that we gained when we work with other people. In addition, studio based learning in the tertiary educational level can guide to formal design learning.

2 Problem Background

In architecture field, the way they learn are different from other field. They learn by creating and visualizing and solve problems by analyzing them and see them as whole and that is the reason why design learning is difficult. To get a best design, designer needs a lot of information to help them in designing processes. The information may come from many resources such as observation, interview clients, literature review, and critique session. The current learning system provided by University Teknologi Malaysia which is E-Learning doesn't help much in supporting the design learning. The current system does not have any application for architecture students to learn from past student's designs. It is not well-suited for such a purpose as it was designed mainly for lecture-based teaching method. For the example, lecturers use E-Learning to upload materials, lectures or topics every weeks while students downloaded and used the uploaded files given. However, the learning method of architectural student's is very different. From the starting of a project until the end of it, most of the things related are getting and sharing

information, designing and then, get feedbacks for every process they did during the process of completing the project. So, this requires a separate system for them to acquire and improve their previous concept and knowledge from the past and present students. They would also need a communication platform amongst their peers to get active feedback from others regarding to their designs.

3 Methodology

In the development of this system, the methodology selection is always play an important role. Selection of appropriate methodology in building a project must be done carefully because it will involve much time, cost and energy in launching it. Furthermore, this is to ensure the implementation of the project can achieve development goals.

The chosen development methodology is Rational Unified Process. According to Kumar, Rational Unified Process (RUP) is a software of development process that consists of four phases which are inception, elaboration, construction and transition [2]. It can guarantee the software that produced is in high-quality and fulfilled the end-user requirements.

Among the advantages of using Rational Unified Process methodology as one of the development system are 1) Developing iteratively, which is also mean that the software elements are integrated progressively and it will be beneficial as the risks can be discovered and eliminated during integration. The function of a Web site is added step - by-step and the errors detected can be corrected. The correcting process can be repeated multiple times to check whether the user requirements are met and the objectives are fulfilled. Web applications are very variable or unstable as immediate reaction to the changes in trends, markets, customer`s wishes are required [3]. 2) The requirements of the users are captured by using cases and scenarios. It will meet the real needs of customers through the whole development process of an application. Therefore, by using Rational Unified Process (RUP), E-Portfolio for Architectural Students can be ensured to fulfill users` requirements [3]. 3) The UML gives standard means of system description. It is important to have visual models of a Web application for controlling the changes and having a better overview of a system.

4 Results

Figure 1 shows the main module of E-Portfolio for Studio Based Design Learning of Architecture Students. This project will act as data repository, where students kept their portfolio and design process. There will be a critique session place for users to get feedback regarding to their designs and lastly for News, it will be the place for users to find and share information regarding to certain events or activities occurs in the faculty.

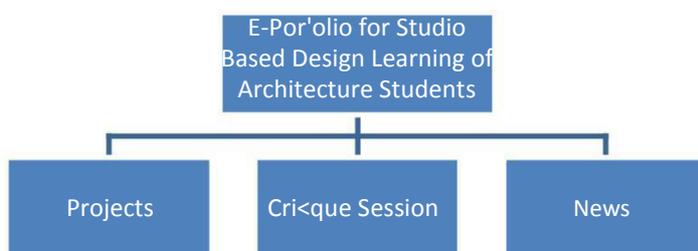


Figure 1 :Main module E-Portfolio for Studio Based Design Learning of Architecture Students

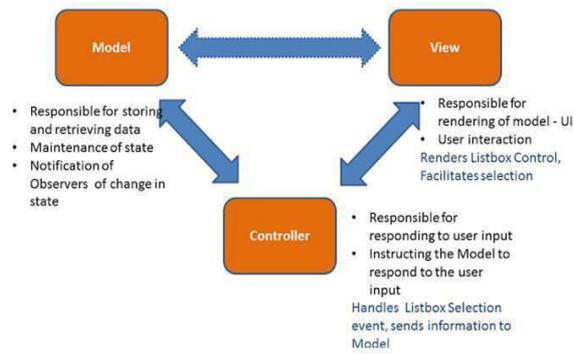


Figure 2 : Model-View-Controller (MVC)

E-Portfolio for Studio Based Design Learning of Architecture Students is developed using *MODEL-VIEW-CONTROLLER* (MVC) approach for the software architecture. MVC consists of three components which are Model, View and Controller. Model is responsible for controlling flow of data in and out from database. View is responsible for displaying the interfaces while Controller will handle or control the data interaction process in the system. For example, the users selected a portfolio, the data or input from the selection will be received by View and sent to Controller. Controller will process the data and access Model to get the data (portfolio information) . Next, the controller will send the information to View to display to user. Basically, MVC can help developer to separate codes to three sections. This will help the maintenance of the system to be easier to organize.

This project is using Laravel framework. Laravel is a free open source PHP web framework which is created for the development of web applications by following the model-view-controller (MVC) architectural pattern [4]. It is fast and easy to learn and it encourages the users to adopt best practices of PHP coding. It also has vast community support and great documentation. For the coding part, PHP Storm is used. Php Storm is a commercial, cross-platform IDE for PHP to build on JetBrains IntelliJ IDEA platform. It provides an editor for PHP, HTML and JavaScript with the fly code analysis, error prevention and automated refactorising for PHP and JavaScript code. It supports PHP 5.3 and onwards [5].

The examples of the system interfaces can be seen in Figure 3, Figure 4 and Figure 5. Figure 3 shows the user Project interface. Figure 4 shows the Critique Session interface. Figure 5 shows the scribble interface during commenting.

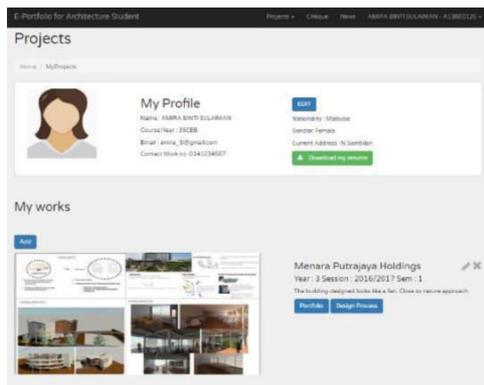


Figure 3 :MyProject Interface

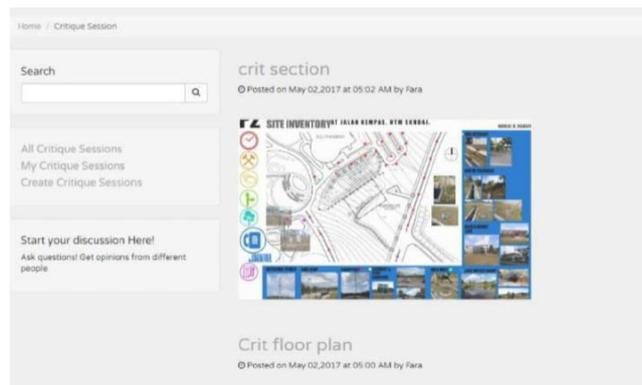


Figure 4 : Critique Session Interface



Figure 5 : Scribble Interface

5 Discussion

In this project testing is conducted, the testing consists of two parts one is functionality testing using black box technique and the other one is user acceptance testing. Black box testing will check on every function and ensure that all are working properly and giving the desired output. Figure 6 shows feedback of the system after the user acceptance testing.

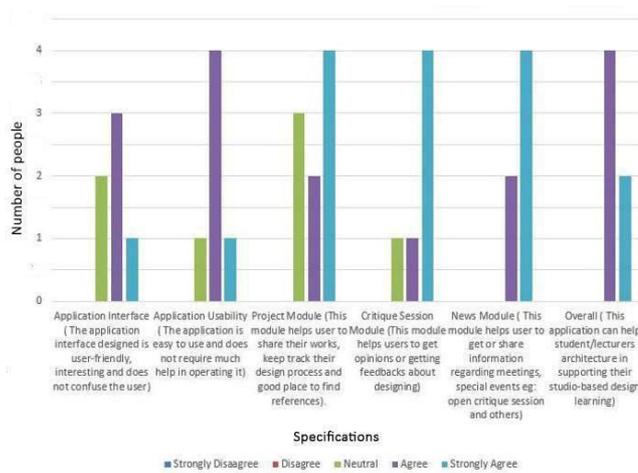


Figure 6 :Graph Bar Result from User Acceptance Form for Architectural Students

All respondent agree that this system can help student of architecture in supporting their learning which is studio-based design learning. This show that this system can help them in some parts or phases when they designing or finishing a project.

6 Conclusion

The system is successfully developed, but there are some weaknesses. For the examples, future enhancement is needed for the development of this system which are the creativity for building an interesting user interfaces and initiative to ease the users in learning to use it. Even though the system has some weaknesses, but it has been determined to be functional and fulfill users' requirements. For functionality parts, the critique module and project module should be related in designing process part as it can run the process easier and to ease the visitors' understanding on how the design is developed. For the lecturers part, certain function such as creating virtual classroom or group can be added so that they can easily find their students. Besides, the system should be integrated with social network such as Facebook. This action can increase the usage of the system because there are some users who like to share their works to the public. With the exposure of this system to social network, the system can be more easily visited by outsiders.

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