Web-Based Master Student Project Evaluation and Management System

Ng Kar Song*, Juliana Wahid

School of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, MALAYSIA

*Corresponding Author Designation

Abstract : Project in Computing is one of the core courses in Master of Science (Information Technology) (MSc. (IT)), School of Computing (SOC), Universiti Utara Malaysia (UUM). It is a platform where students can showcase the knowledge and skills they obtained during classes by implementing a project. The current practice of Project in Computing evaluation is through manual procedure which the submission of proposal and article to the evaluators were through email. There is no system to help the coordinator, evaluators, and supervisors in managing the evaluation process of the Project in Computing. This study aims to develop a web-based project evaluation and management system named "Evaluation Virtual Assistant" (EVA) to facilitate all users involved in the Project in Computing evaluation process. The prototypes of the proposed system will be developed using XAMPP. Typically, there are four evaluation phases in the Project in Computing, which are proposal, article, presentation, and final report. There were two evaluators that will evaluate both the proposal and article. Another two evaluators will evaluate the presentation, while the supervisor will evaluate the final report. In the proposal and article evaluation, the evaluators should also provide recommendations. Students need to update the proposal and article based on the recommendations. After the evaluators and supervisor completed the evaluation phase related to them, the coordinator can view the total marks obtained by students and proceed to finalize the mark. This web-based project evaluation and management system could speed up the evaluation process while improving efficiency and accuracy of the marking task.

Keywords: Web-based system, Project evaluation, Management system, Evaluator, Master student

1. Introduction

Project in Computing is a compulsory taking subject for every Master student in School of Computing (SOC), Universiti Utara Malaysia (UUM). As UUM do not own any system to help lecturers and supervisors to evaluate in Project in Computing related works, it would take a lot of manpower to do manual works. Those are tiresome and repetitive processes such as calculation of each evaluation phase and each evaluator, sending message of recommendation and calculation of total marks for each

student. This tedious process is also time consuming as the evaluators need to calculate the marks for number of times just for a student. Evaluators might make mistake when doing calculation or setting grade for students, this might affect the accuracy of marking.

The problem of the project evaluation work is that the evaluators of Project in Computing have to manually perform them. By performing compilations and calculation are very troublesome. In other word, the processes are neither effective nor efficient as time has been wasted in performing the calculation [1]. The way how the Project in Computing evaluation being managed is very inconvenient. Therefore, creating problem in terms of efficiency where the lecturers and supervisors waste their time to do repetitive calculation tasks that can be done by a system itself. Sometimes, it is frustrating for the project evaluators to perform tedious processes of calculation.

There might be scenarios where project evaluators would do mistakes in calculation. This will affect the Project in Computing result of a certain student. The project evaluators might too, key in the wrong data for the Project in Computing evaluation. This would greatly affect the accuracy of the project evaluation, and the students who affected by this might bear degrading, and even worse, causing the students have to retake the Project in Computing again.

This project is significant because it can increase the efficiency of project evaluations to calculate Master students' project mark in each phase by simply filling in the mark in the field given. The second is that the system can help to save evaluators time as they do not need to do repetitive task that is consuming time [2]. The third significance of this project is to increase the accuracy of the project evaluation, this system helps to overcome error and mistake in calculation during the project evaluation.

This project aims to develop a project evaluation and management system for Master students, to evaluate the developed project evaluation and management system for Master students, and to facilitate evaluators in evaluating Master students' project. This system is named as Evaluation Virtual Assistant (EVA). This project focuses on developing a system for project evaluation and management of Master students in UUM. Design of the system will follow requirements gathered in order to ensure it is developed according to the need of the evaluators. This project has been carried out in 2 semesters or 8 months starting from October 2021 to August 2022. The target users of this system are focussing on project evaluators in UUM. The main function of this system is to help project evaluators to ease their calculation jobs and other evaluation related tasks. Thus, it can facilitate them in evaluating projects, making it to be more efficient and time saving when doing the evaluation jobs.

2. Methodology

This project has been carried out according to the five main phases as explained in **Figure 1**.
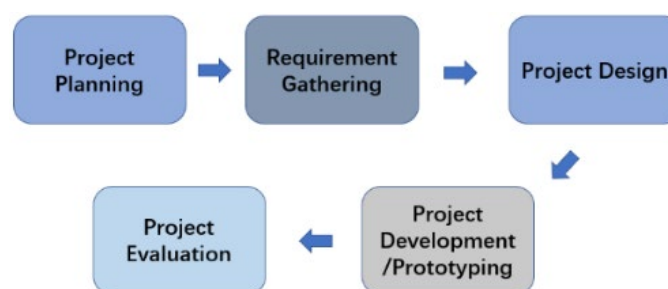

Figure 1: Five Phases in Methodology

2.1 Project Planning

In project planning phase, research related to the topic has been conducted. Related research conducted included background of the topic, previous work that has been done by other developers, problem statement, research objectives, project scope and significance, methodology has been used in

this project (Project Planning, Requirement Gathering, Project Design, Project Development/Prototyping, Project Evaluation) and the project schedule. The deliverable of this phase is the proposal.

2.2 Requirement Gathering

The requirements for the system proposed in this proposal has been collected from the existing guidelines and from the review of existing project evaluation and management system [3]. The deliverable of this phase is a list of functional and non-functional requirements of the proposed system.

2.3 Project Design

The main components that are going to be designed in this phase include the diagrams of the project using Unified Modelling Language (UML) which include the use case diagram, activity diagram, sequence diagram, collaboration diagram and class diagram. The requirements gathered will be converted to these diagrams in order to understand what is needed. The system design will be web-based approach. There are four evaluation phases for the project in which two evaluators for each phase, and where the proposal evaluators will also evaluate the article. In the process of evaluation, both evaluators used the same rubrics. Both evaluators will provide marks to the system for each category in the rubrics. In addition, evaluators also provide recommendation to the system in the evaluation phase of proposal and article. Then, the system will calculate total marks for each evaluation phase and for each evaluator respectively. This system will also send the recommendation from the evaluators to the students besides calculating the total marks for each student. The deliverable of this phase is a complete requirement specification and design of the proposed system.

2.4 Project Development/Prototyping

The low-fidelity prototype of the proposed system has been developed using XAMPP. XAMPP is one of the widely used cross-platform web servers, which helps developers to create and test their programs on a local webserver. It was developed by the Apache Friends, and its native source code can be revised or modified by the audience. It consists of Apache HTTP Server, MariaDB, and interpreter for the different programming languages like PHP and Perl. XAMPP helps a local host or server to test its website and clients via computers and laptops before releasing it to the main server. It is a platform that furnishes a suitable environment to test and verify the working of projects based on Apache, Perl, MySQL database, and PHP through the system of the host itself. Among these technologies, Perl is a programming language used for web development, PHP is a backend scripting language, and MariaDB is the most vividly used database developed by MySQL. High-fidelity prototyping will continue to include 100% of the functions specified in the requirement specification.

2.5 Project Evaluation

Evaluation has been conducted at this phase with group of testers [4]. Functionality test has been conducted by the developers to identify bugs and errors while user acceptance test has been conducted by the respondents selected among the evaluators and Master students of Universiti Utara Malaysia (UUM).

3. Results and Discussion

EVA was designed and developed to facilitate evaluators so that they could save time while improving efficiency and accuracy of the marking task [5]. This web-based system comprises of major functions including assign project, file submission, view submitted file, update and delete of project, project mark calculation, and add recommendation.

Typically, there are four evaluation phases in the Project in Computing, which are proposal (15%), article (35%), presentation (10%) and supervisor report (40%) accordingly. For phase 1 to 3, there were

two evaluators for each phase, where the proposal evaluators will also evaluate the article. In the process of evaluation, both evaluators used the same rubrics. Both evaluators provide marks for each category in the rubrics. In addition, evaluators also provide recommendation in the evaluation phase of proposal and article. This website will calculate total marks for each evaluation phase and for each evaluator. Then, it will send the recommendation from the evaluators to the students. Besides, calculation for the total marks for each student will be done and displayed in the system. The system developed have different interfaces for each user and have navigation buttons that are able to interact with the user. The details of explanation on the user interface can be found in Appendix A.

4. Conclusion

The system has been successfully designed and developed to meet all the requirements. In database design, one should pay attention in protecting data integrity and eliminating data redundancy [6]. The initiative aims of this project have been achieved which Master students project evaluation and management system has been developed successfully. In addition, the developed project evaluation and management system can be used to evaluate Master students' project. This system can be used to facilitate evaluators in evaluating Master students' project. There are some insufficient parts that can be improved in this system such as automatically logout if the users have offline for a certain period. However, those parts will be applied in future work since the time to apply it on the system is not enough. More suggestions will be collected in future to improve the system.

Acknowledgement

Appendix A

This appendix consists of the details of explanation on the user interface of the system.

The user is required to login at homepage of the system. At the homepage, as shown in **Figure A1**, there are logo and name of Universiti Utara Malaysia (UUM), name of the system, and login panel for inputting the username and password. At the bottom of the login panel, forgot password link and link to registration of new user are there to make it easier for users to make their respective actions. After user click "Register here" at the bottom of **Figure A1**, the registration page as shown in **Figure A2** will be appeared.
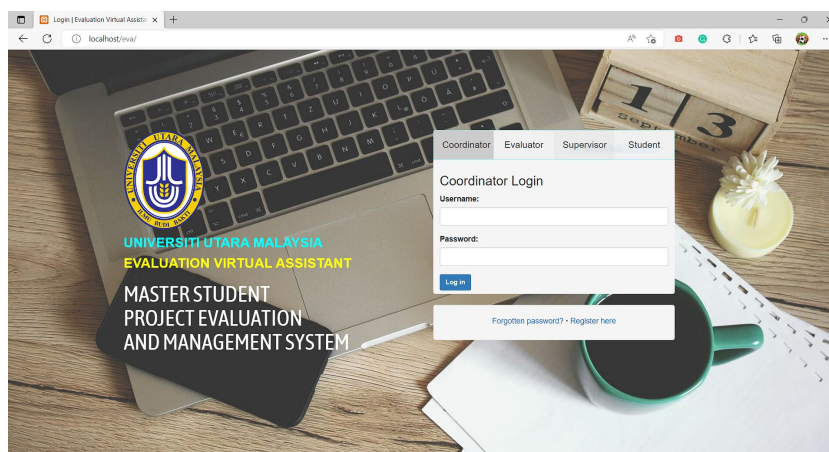
Figure A1: Homepage/login page of the system

For first time user, the user is required to register at the registration page as shown in **Figure A2** by enterring required data such name, username, email address, type of user they want to register and password in the registration form before able to login and do their subsequent actions. After creating an account, user is able to login by using username and password.
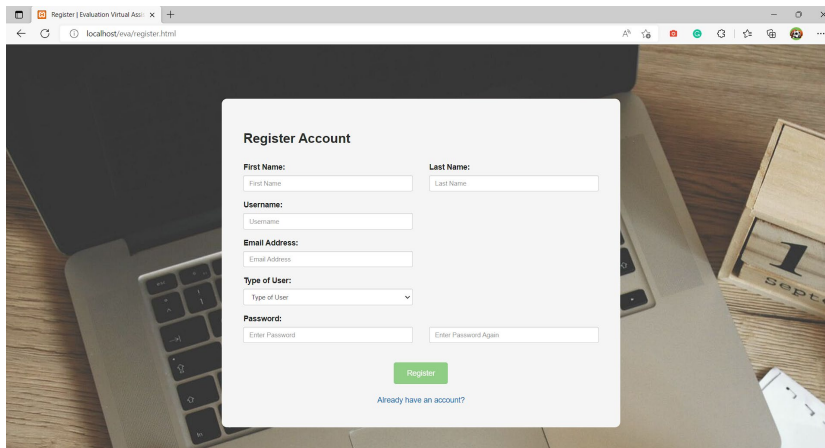
Figure A2: Registration page of the system

If the user forgot their password, they can change their account password at the forgot password page as shown in **Figure A3**. They will need to enter the email that they have registered for the account and submit it by clicking on "Send Verification Email" button. The user can navigate to forgot password page by clicking on "Forgotten password?" link at the bottom of **Figure A1**.
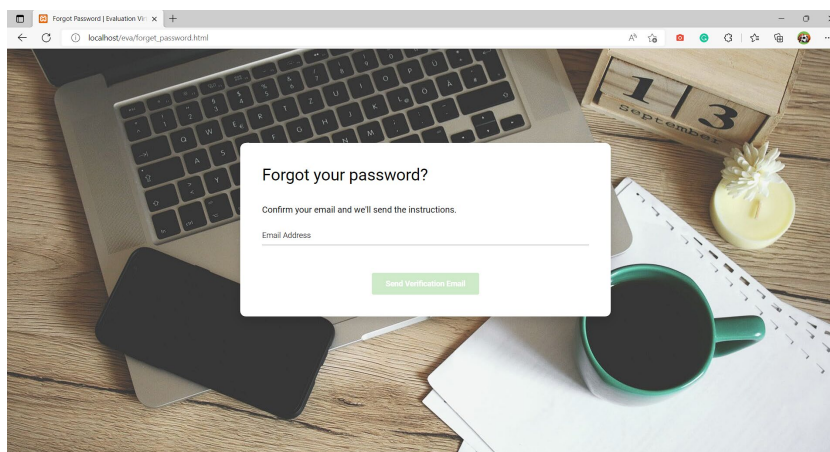
Figure A3: Forgot password link of the system

If the user have logout and go to a certain page, the system will redirect to authentication page as shown in **Figure A4** and ask them to login in order to proceed.
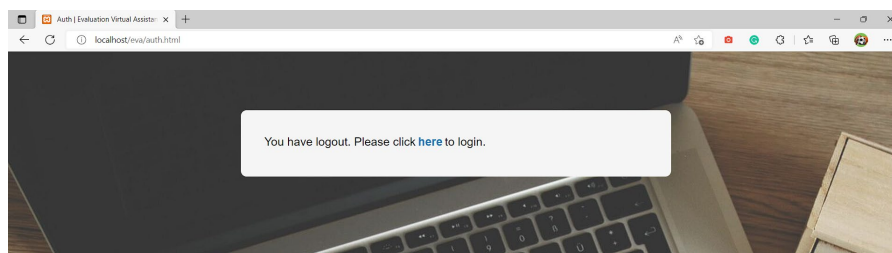
Figure 4: Authentication by the system

When coordinator login into the system, the dashboard page will show the marks for each evaluation phase, if the mark for the evaluation phase is not evaluated yet, then the mark will be displayed as "Not finished" in the table as shown in **Figure A5**.

Figure A5: Coordinator dashboard of the system when mark of a phase is not evaluated

Otherwise, if the mark for the evaluation phase has been evaluated, then the mark will be displayed in the table as shown in **Figure A6**.

Figure A6: Coordinator dashboard of the system when marks of all phases have been evaluated

The coordinator can navigate to assign project page by clicking on "Project > Assign Project" on the navigation bar on top of the webpage, the coordinator can assign new project by entering the project title as well as selecting the name of student, evaluators and supervisor name. The project assigned will be updated and shown in the table on the right. The assign project page is as shown in **Figure A7**. The coordinator can click on "Edit" (Pencil icon) button for a project to navigate to edit project page as shown in **Figure A8**.

Figure A7: Assign project page for Coordinator

The coordinator can click on the "Edit" button to edit a project, the details of the project will be shown on the left, the coordinator can modify them and click on "Submit" button to update it. The edit project page is as shown in **Figure A8.**
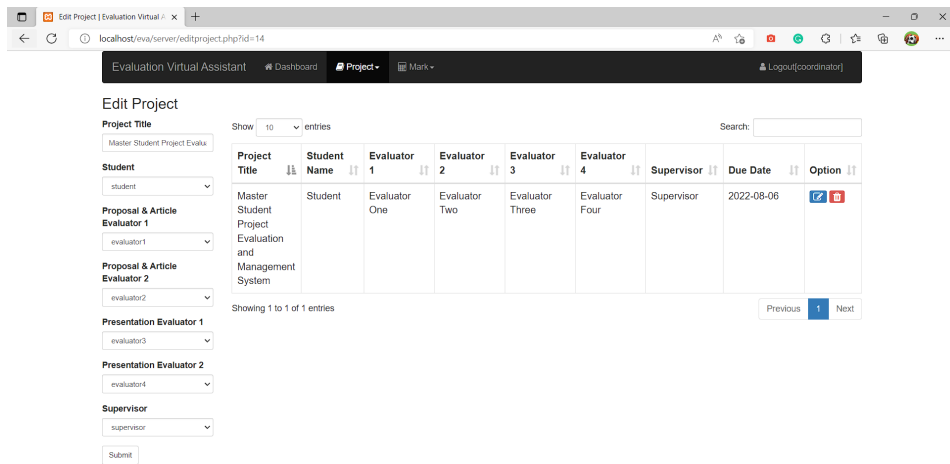
Figure A8: Edit project page for Coordinator

The coordinator can click on the "Delete" button to delete a project, a message will be prompt to ask coordinator to delete the project as shown in **Figure A9**.
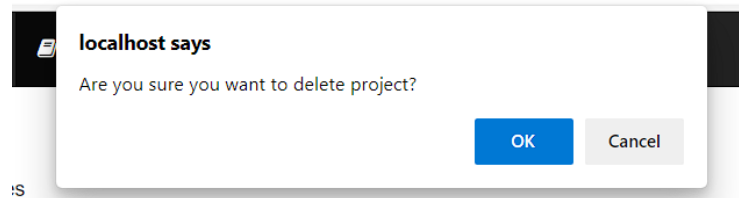
Figure A9: Delete project page for Coordinator

The coordinator can navigate to view file page as shown in **Figure A10** by clicking on "Project > View File" on the navigation bar, the coordinator will need to choose student name and phase on the left, and all the files uploaded for the phase will be shown on the right. The uploaded file can be downloaded by clicking on its name.
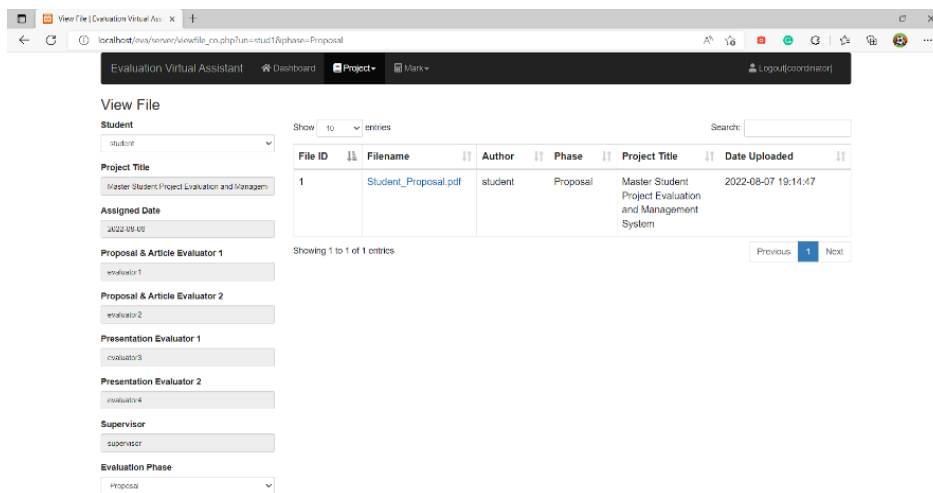
Figure A10: View file page for Coordinator

The coordinator can navigate to calculate mark page as shown in **Figure A11** by clicking on "Mark > Calculate Mark" on the navigation bar, the coordinator will need to choose student name, phase and

component on the top, and all the marks of certain phase will be shown with its rubrics. The coordinator can view the file of certain phase by clicking on "View" button.

Figure A11: Calculate mark page for Coordinator

The coordinator can view recommendation for the students written by evaluators by selecting "Recommendation" for the component as shown in **Figure A12**.

Figure A12: View recommendation page for Coordinator

The user can navigate to view file page as shown in **Figure A13** by clicking on "Project > View File" on the navigation bar, the user (except student) will need to choose student name and phase on the left, and all the files uploaded for the phase will be shown on the right. The uploaded file can be downloaded by clicking on its name.

Figure A13: View file page for Evaluator, Supervisor and Master Student

The user can navigate to calculate mark page as shown in **Figure A14** by clicking on "Mark > Calculate Mark" on the navigation bar, the user will need to choose student name, phase and component on the top, and all the marks of certain phase will be shown with its rubrics. If the file is not found, the system will show the message on the button. The user can enter the marks and click on "Submit" button to submit the marks.

Figure A14: Calculate mark page for Evaluator and Supervisor

The supervisor is not able to view the marks for other evaluation phase unless the evaluation phase of presentation is completed. **Figure A15** shows the page where the supervisor can view marks for all the evaluation phase.

Figure A15: Evaluation phase for supervisor after presentation phase is completed

The student is able to submit/upload file in file submission page for each evaluation phase by clicking "Project > File Submission" on the navigation bar. Then, they can upload file in the file submission page as shown in **Figure A16** by selecting file from their device.

Figure A16: File submission page for Master student

The student can view recommendation written by evaluators by clicking on "Mark > View Recommendation" on the navigation bar. They can view the recommendation that has been given by their respective evaluators for a certain evaluation phase as shown in **Figure A17**.
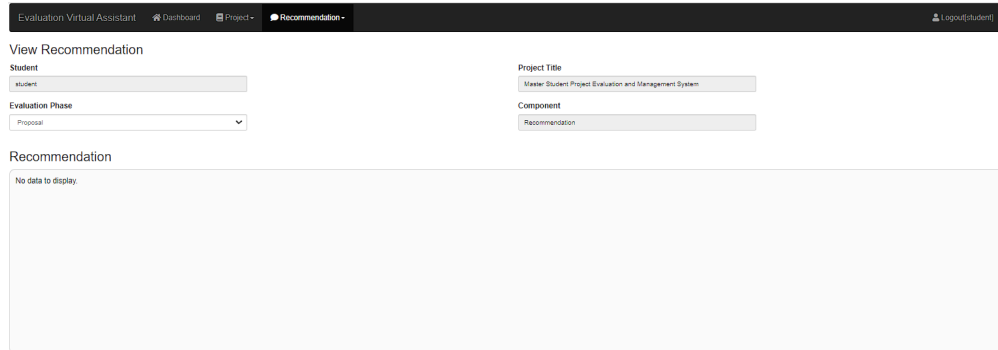

Figure A17: View recommendation page for Master student

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