

HighTeach: A Web-Based Teacher Evaluation System for a Higher Learning Institution in the Philippines

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Article history

Received : September 09, 2022
Accepted : September 28, 2022
Published : October 01, 2022

Keywords:

Software Design
Software Development
Software Development Life Cycle
Teacher Evaluation
Web-Based System

Abstract

The study is primarily aimed at describing how to design and develop a teacher evaluation system for a higher learning institution in Nueva Ecija, Philippines. Specifically, it sought to describe the activities undertaken in the software development lifecycle stages, including planning and requirements analysis, design, development, and testing. Maintenance and deployment stages were not covered in this study. Using developmental research, proponents developed the system following the SDLC stages. The results show how the proponents successfully developed the system. Proponents suggested that future studies may be conducted which may focus on the assessment phase covering deployment and maintenance stages, to learn how end-users and information technology (IT) experts view the developed system.

Cite this article as: J.M. Amboya, R.M. Francisco, R.J. Hernandez, J.S. Opeña, I.V. Samson, C.N.P. Olipas, "HighTeach: A Web-Based Teacher Evaluation System for a Higher Learning Institution in the Philippines", *African Journal of Advanced Pure and Applied Sciences (AJAPAS)*, vol. 1, no. 4, pp. 8–15, October – December 2022.

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1. Introduction

One of an instructor's responsibilities is to aid students in acquiring competence, developing new knowledge, and refining individual characteristics and virtues. Such responsibilities require dedication and hard work. Thus, teachers play a very crucial role in community building. Teachers also play a significant part in influencing the lives of young people. In the course of educating the young, several activities must be conducted by an educator to achieve these goals.

Assessment of teachers' performance is a necessary activity that learning institutions must conduct because it aids in understanding the good and harmful activities and performances done by their respective educators. Teachers' evaluation is a vital component of a learning institution that serves as a mechanism to improve the quality of instruction delivered to every student. Teacher evaluation also pertains to the activity wherein students try to assess their teachers according to what they observe, particularly in the teaching process [1]. Assessment results on the teachers' performance may improve their practice and effectiveness. It may also result in improved student learning and success.

In many schools, teacher evaluation is commonly performed using pen and paper, making it difficult to tally all the students' answers. Teacher evaluation is also time-consuming, slow, and takes a lengthy process [2]. Traditional evaluation can also be expensive because of the pieces of paper and the ink required to produce the forms. Security and confidentiality of the results is also a problem encountered using the pen-and-paper evaluation method. Further, unauthorized access and the proneness of the files and records to unfortunate scenarios such as fire and flood are also problems. Thus, in general, the process of manually evaluating teachers' performance poses a lot of challenges and difficulties.

Offering an online evaluation saves time and money and gets the result quicker. Fortunately, in this modern age where technology is everywhere, things are more accessible—information technology solutions aid in effectively delivering processes in different areas, including the education sector.

Several studies have been undertaken to describe the development of an online evaluation system. Qi (2017) developed a computerized system to evaluate teachers' performance. As a result, teachers' skills and the quality of teaching have been improved through timely generation of reports for decision-making. Using ASP.NET, C#, and SQL, Qi [3] developed the system [3]. Amjad and Linda [2] expressed that using a web-based evaluation system can quickly evaluate teachers' performance [2]. By providing timely evaluation results, teachers' personal and professional growth can lead to improved performance. Though many studies have been undertaken, proponents of this study aim at contributing to the existing body of knowledge by focusing on developing information technology solutions, particularly a web-based teacher evaluation system. The development of the system in this study contributes to the growing number of development researches that may benefit future research and capstone project proponents in the field of information technology.

1.1. Statement of the Objectives

This study, "*HighTeach: A Web-Based Teacher Evaluation System for Higher Learning Institutions*," aims to provide a better teacher evaluation. The study sought to improve the manual process of evaluation by providing an information technology-based solution.

More specifically, it aims to describe the software development lifecycle activities conducted by the proponents in design and development in terms of:

- 1.1.1 Planning and requirements gathering;
- 1.1.2 Design;
- 1.1.3 Development; and
- 1.1.4 Testing.

1.2. Scope and Limitations

This project focuses on designing and developing an evaluation system for a higher learning institution. The contents of the evaluation differ from one learning institution to another. In this study, the contents for the evaluation were adapted from the existing forms used. The system enables end-users to create their own accounts, perform an evaluation of their respective teachers, and view relevant reports. Administrators of the system hold more system features, including the improvement of the contents, report generation, and overall system maintenance.

The project was conducted in times of pandemics. Proponents were forced to conduct limited on-site interviews and observations. However, online interviews were still conducted. As for the software development lifecycle stages, deployment and maintenance were not covered in this study. Actual assessment by the end-users of the developed system was not covered.

2. MATERIALS AND METHODS

The developmental research design was utilized for this study to design and develop the system. Seels and Richey [4] explained that development research is “the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness” [4]. For this study, the design focused more on developing the system to provide an output that would solve existing problems encountered relating to teachers' evaluation in higher learning institutions in Nueva Ecija. The proponents had involved intended primary users of the system as the source of the necessary information for the project's development.

In the development of the system, the proponents followed the stages of the software development lifecycle. Vital stages include planning and requirements gathering, design, development, and testing. This study did not cover the remaining stages of the development lifecycle, focusing on deployment and maintenance. Proponents ensure that the data and requirements gathered are treated with the utmost confidentiality and security.

Further, essential considerations to guarantee that the development of the project would not cause any harm to any person or institution have been strictly observed.

The studies by [5] [6] and [7] have implemented developmental research, and they have found out that using the design, they have successfully developed information systems and applications. Thus, the application of an appropriate design for a study is necessary for the achievement of the overall goal and objectives.

3. RESULTS AND DISCUSSION

3.1. Planning and Requirements Analysis

This stage of the software development cycle has been crucial for the project's development. Planning sets the direction and how the design and development will take place. Planning is necessary for software developers to ensure that the requirements given are considered, analyzed, and included in the overall plan. This agrees with Soken-Huberty [8] about why planning is essential [8]. Soken-Huberty [8] expressed that planning helps set appropriate goals, helps break a problem or goal into smaller pieces, aids in revealing the project's strengths and weaknesses, helps increase certainty and confidence, and increases efficiency. Moreover, planning reduces risk, increases credibility, encourages creativity, improves decision-making, and ensures peace of mind for the development team members and clients [8].

Proponents of this study used a variety of data collection techniques, including on-site observation and document analysis, interviews, and reviews of related studies. While the study was conducted during a pandemic, proponents have utilized available means such as different online platforms (e.g., Zoom and Google Meet) to conduct interviews with end-users still.

A Gantt chart was also developed at this stage. This tool helps the proponents to analyze the timeline and identify the significant activities that must be accomplished. Progress is shown in the Gantt chart, making the proponents easily monitor the status of the design and development of the project. Having a properly designed Gantt chart helps developers better track their work's progress and boost their productivity. Also, overlaps and dependencies can be identified. Figure 1 presents the Gantt chart for this study.

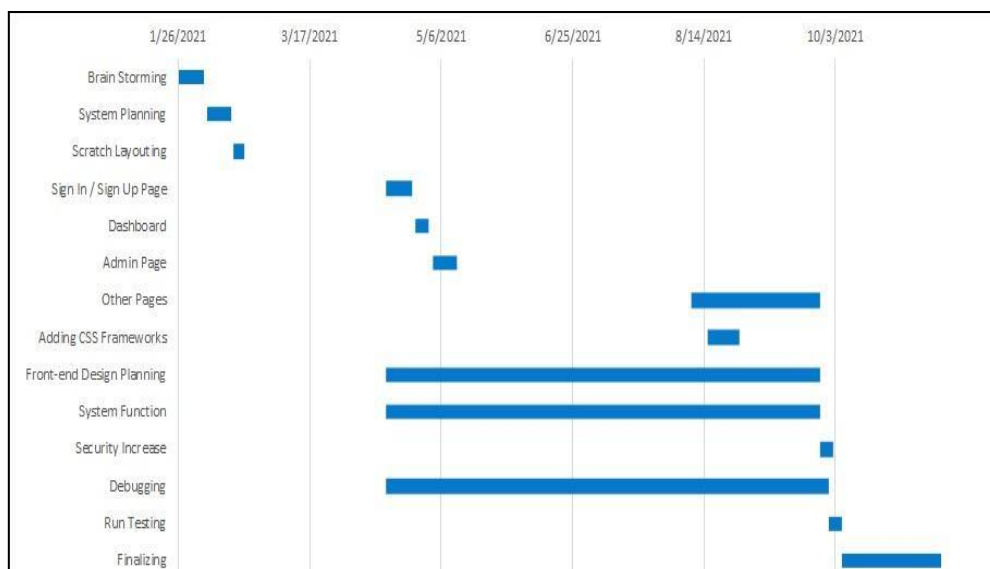


Figure 1 Gantt chart for HighTeach.

3.2. Design

In the development lifecycle, software design plays a very crucial role in the overall quality and success of the project. Software design involves two levels – architectural and detailed design [9]. In architectural design, basic diagramming tools can be utilized. Tools like those that data flow diagrams (DFD) and entity-relationship diagrams (ERD) are two of the most commonly used. In this study, the proponents used these diagramming tools to further analyze how to design and develop the system.

A Data flow diagram (DFD) aids the proponents in analyzing the requirements and identifying the necessary processes to be included in the system. Figure 2 shows the context diagram of the DFD.

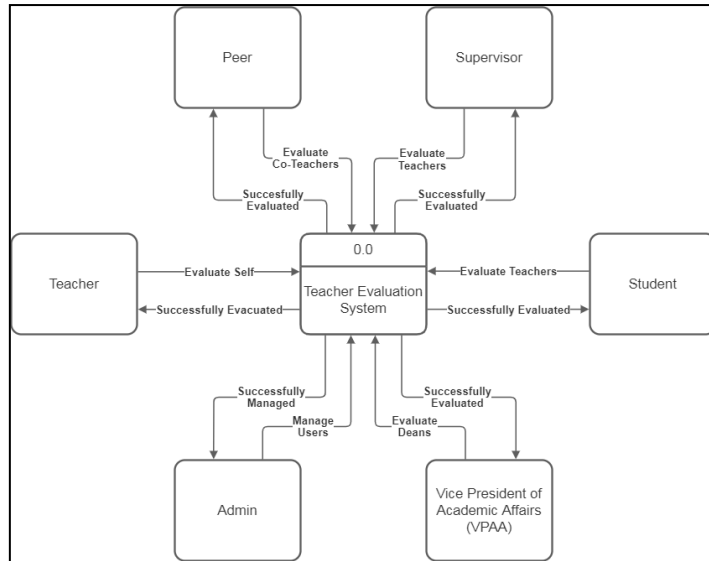


Figure 2 DFD Context Diagram

The Use-Case Diagram allows the proponents to analyze the tasks and scenarios considered for the system. Figures 3 and 4 show the use-case diagrams for the different types of end-users for this study.

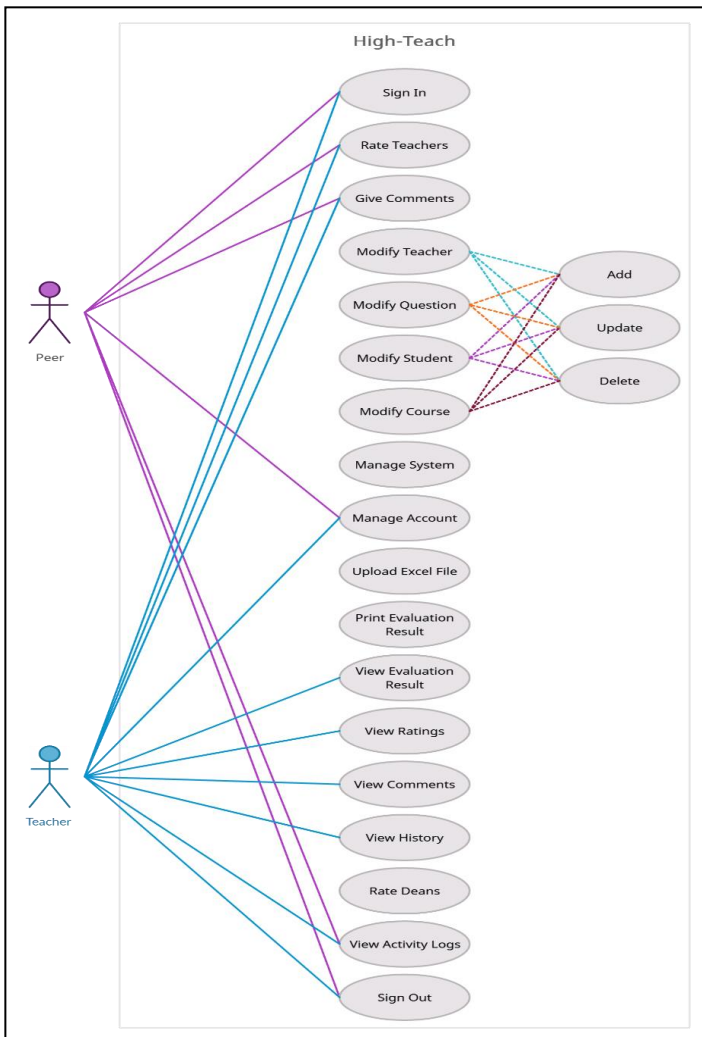


Figure 3 Use-Case Diagram for Peers and Teachers

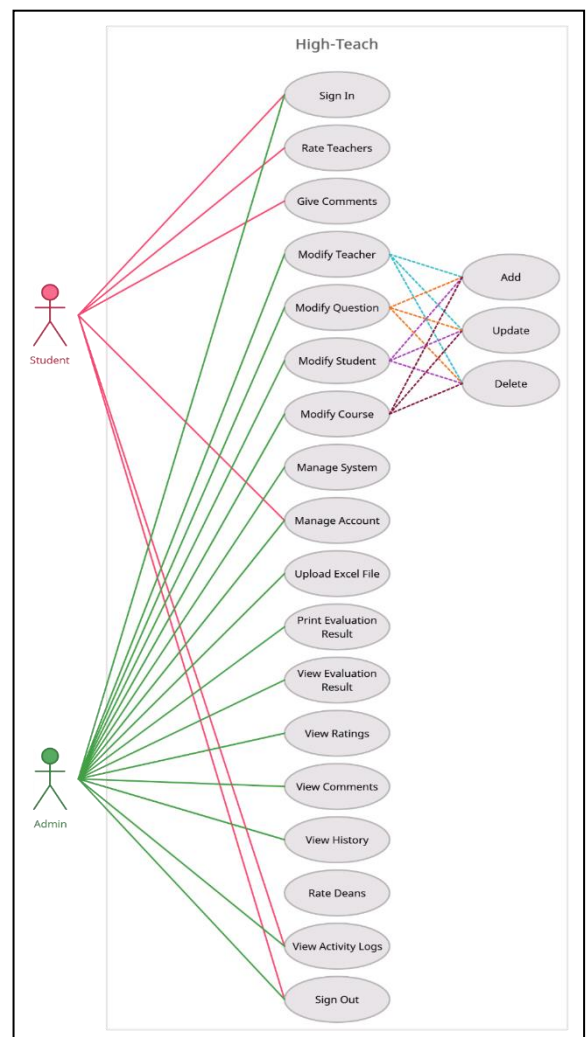


Figure 4 Use-Case Diagram for Students and Administrators

Figure 5 shows the Entity-Relationship Diagram (ERD) for the system. The Entity-Relationship Diagram represents the “decomposition of the subject domain of a system into entities” [10]. In ERD, proponents could deeply understand how entities relate to one another. Cardinalities denote the relationship each entity has. By understanding ERD, the design and development of the system becomes efficient.

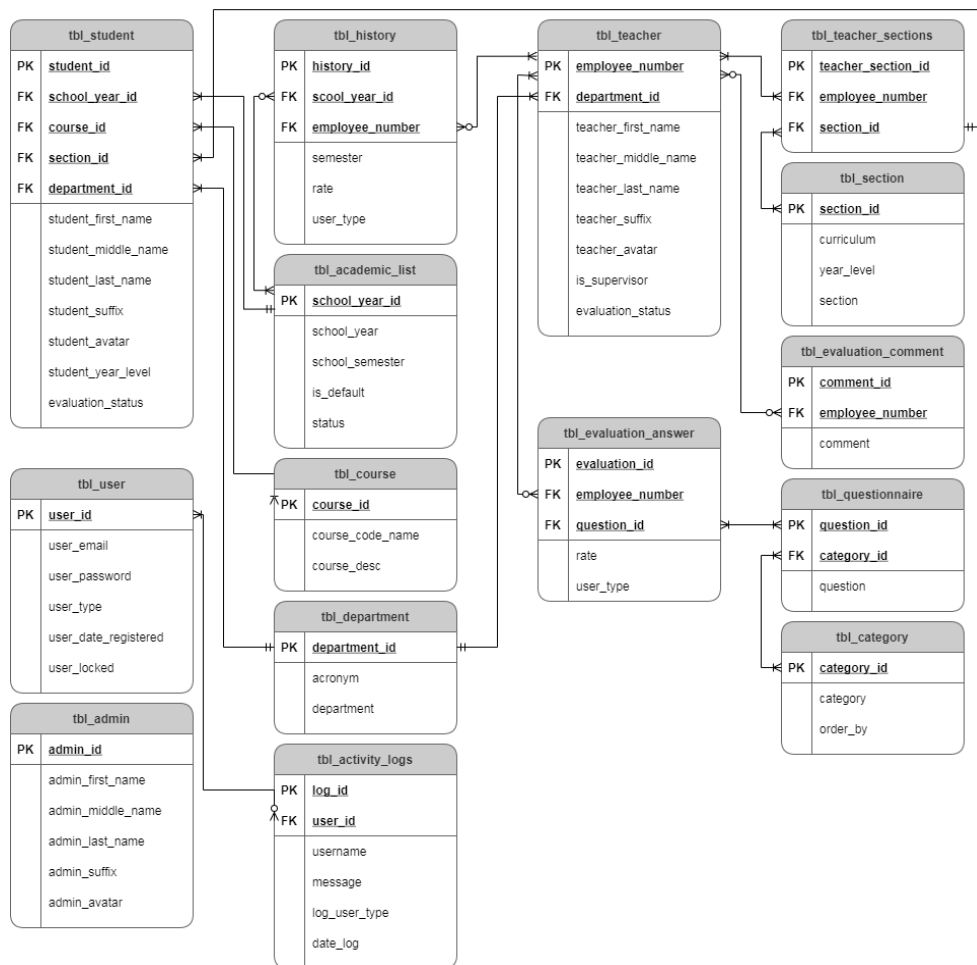


Figure 5 Entity-Relationship Diagram for HighTeach

3.3 Development

The development stage of the lifecycle focuses on the system's actual development using tools such as integrated development environments (IDE), databases, and programming languages. Cross-Platform, Apache, MySQL, PHP, and Perl (XAMPP) is a popular cross-platform web server that allows programmers to create and test their code on a local web server. Through XAMPP, proponents could use HyperText Processor (PHP) as a backend scripting language to create a dynamic website and application. Structure Query Language (SQL) was used for the system's database. On the other hand, Sublime Text Editor is used for writing the script for the system. Figure 6 shows the IDE for the text editor.

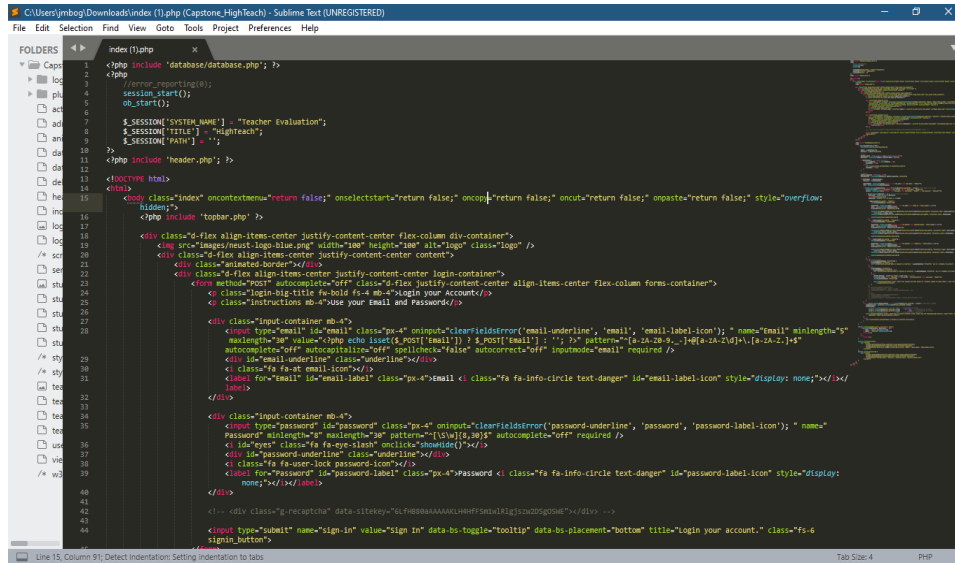


Figure 6 Sublime Text Editor IDE

3.4 Testing

In every development project, the testing stage must be conducted efficiently to ensure that the overall quality of the project produced is acceptable. In testing HighTeach, the proponents test the system's functionality by checking the user interface, including its components, the flow of transactions, and the output produced. As the development progressed, the proponents could adjust necessary changes through the aid of testing activities. Test cases were utilized to guide the proponents in checking the system. Figure 7 shows what the system looks like in the browser, while Figure 8 shows how HighTeach uses mobile devices.

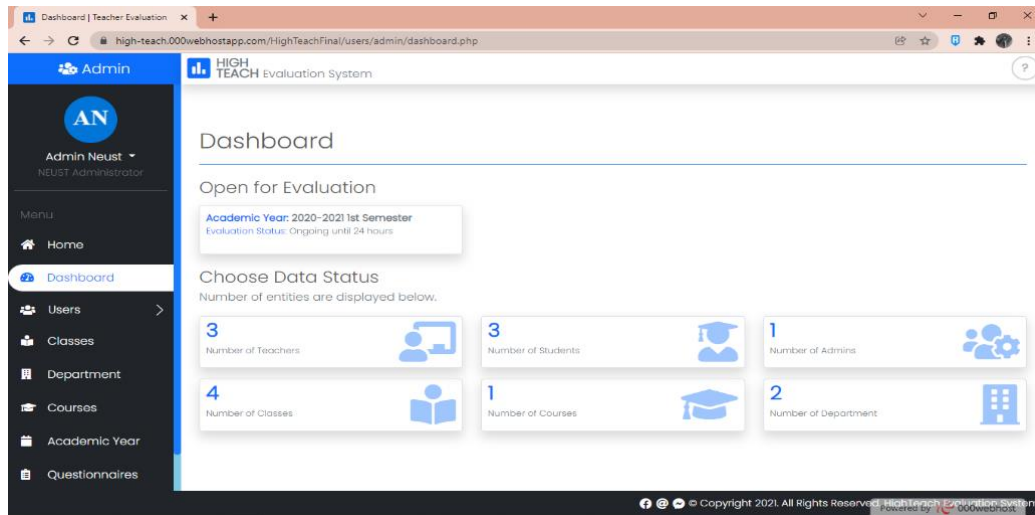


Figure 7 HighTeach Admin Dashboard – Web Browser

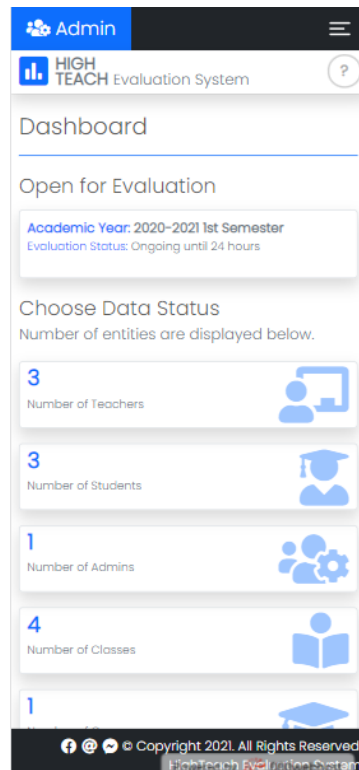


Figure 8 HighTeach Admin Dashboard – Mobile Device

4. Conclusions

This study is primarily aimed at designing and developing a web-based teacher evaluation system for a higher learning institution in Nueva Ecija. The software development lifecycle stages were followed, including planning and requirements analysis, design, development, and testing. The deployment and maintenance stages were not covered in this study. Developmental research produces an output based on analyzing the given requirements. Proponents were able to describe how to design and develop the system.

5. Recommendations

Based from the findings, the following are the recommendations for this study:

1. Proponents and future researchers may include in their future studies the remaining SDLC stages—deployment and maintenance—in order to present how to perform the processes for each stage;
2. Assessment by IT experts and end-users may be conducted to evaluate the overall quality of the system based on established software criteria; and
3. Future studies may look into the results of this study to serve as their basis for developing related software development projects.

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