Performance and Usability Testing for Online FYP System

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Abstract. Online management systems have been progressively developed and adopted by
domestic management in higher learning institutions, schools, and offices in the public and private
sectors as well as in business management. The developed system can facilitate all process
management and thereby benefit many organizations and individuals involved. But before
applying a system, usability testing should be made so that all the problems and errors can be
identified prior to implementation. This paper analyzes the survey results about the usability of
an online management system which is currently being developed: Online Project Evaluation
and Supervision System (oPENS). Currently the system has partially developed a few
processes in managing FYP such as submission of project approval forms, weekly reporting
management process, and group registration process. For the next step, response from system
users is needed so that this system can be completed better
by fulfilling the features required by
all users in addition to identifying problems that could arise before this system is implemented.
To identify the system performance and to obtain lecturers’ responses about this system, a
usability test is carried out where lecturers need to explore the system practically and answer
the questionnaire in the end. There are three usability testing components that have been
highlighted in the survey questions i.e. system appearance and interface, user-friendliness and
system efficiency. During the system testing, Think Aloud method has been applied whereby
the respondents are free to give any comment or suggestion for the system improvement. Most
of the respondents strongly agree that this developed system can assist in the FYP supervisory
process and also greatly assist coordinators in ensuring the FYP process runs
smoothly. There
is also a few suggestions that has been listed for the system’s improvement.

1. Introduction
The final year project (FYP) is a subject that must be taken by a Diploma in Electrical Engineering
student for one year. During the first semester, students need to look for ideas to suggest any
innovation projects that can help solve everyday problems. Students should prepare the first semester
in the FYP1 course, where they need to complete all project requirements such as meeting with
supervisors, writing weekly reports in logbooks, attending presentation of project progress and finally
submission of final proposal paper. Continuing in the next semester, the student will complete the
project's prototype and submit the final project report. FYP management process should also be done
by supervisors such as monitoring project progress, evaluating the overall project in terms of
teamwork, attendance, work progress and so forth. All FYP management activities are conducted by
three parties, namely lecturers, students and subject coordinators. Lecturers act as supervisors and also
examiners. FYP management involves many documentations, assessments, supervision and weekly reports. For now, all the processes are done manually without having an integrated system that helps FYP management. What happens is that the management process becomes less efficient, time consuming, and results to waste of paper for documentation and storage purposes. Coordinators will be burdened with the management tasks as it involves huge number of students. Some parts of oPENs have been developed, such as submission of project approval forms, weekly reporting management processes, and group registration process. Before proceeding with the development of the system, an experiment should be made to obtain feedback from Faculty of Electrical Engineering (FKE) lecturers about the usability of the system and to know how far the system will benefit them.

2. Literature Study
FYP is vital to demonstrate the students’ abilities in combining knowledge, skills and traits that have been acquired during their program undertakings. FYP completion also enables the students to experience research works, teamwork and time management. Being an accreditation requirement, FYP is the best platform to represent the competencies of technical skills and soft skills of the students. Therefore, FYP assessment needs to be conducted carefully and managed systematically to guarantee the program’s quality [1-3].

Currently, there are various integrated systems being offered to aid management systems. The findings from previous researches conclude the necessity for an integrated system of monitoring system to provide a medium for better communication among all parties and improve FYP management to be more effective and systematic [4-6]. Academics also have supported that an integrated system provides convenience for supervisor and students throughout the process of FYP [6]. The findings also have shown that the use of e-learning platform is possible to help providing a supportive environment for students in their research journey [7]. This technology platform also can support a paper-less process and environment [8]. Finding also shows the integrated system receives positive feedback from the lecturers because the system eases the lecturers’ and coordinator’s work [9]. The FYP system also plays a role in support of student-centred learning for final year project [10]. Therefore, the objective of this study is to measure the system usability and overall performance such as the appearance, interface, user friendliness and efficiency of the system. A survey has been conducted among FKE lecturers that have experienced the management of FYP subject as supervisor, examiner and also coordinator.

3. Methodology
oPENs was developed to ease the FYP management process including registration and supervision. It can accommodate the manual processes such as registration and progress monitoring by the coordinators and supervisors. Moreover, this system also serves to facilitate the assignment of a supervisor to each student according to their groups. This system consists of several separated modules, where each module has its own function and usability. Figure 1 shows the main menu page for oPENs. There are announcement corners and system archive is provided in the main menu page of oPENs. The announcement corner informs the user of the latest recent information while system archive can be used to access all previous FYP projects that are stored for reference purposes. In
addition, login buttons are also available to all users, including coordinators, lecturers, students and administrator.

3.1. Profile module
Currently all responsible parties in the FYP course including the coordinator, supervisors and students can access the system and update their profiles as shown in Figure 2. But only the administrator can assign the FYP coordinators and supervisors. The administrator is responsible for managing all the forms in FYP such as evaluation form and validation form. Moreover, the scope of an administrator task also involves enabling the current semester and managing the addition of new students. One of the users in this system is the students. They can access their accounts through the sign-in system using their matrix numbers. Students are responsible for updating any information related to their project including changing the titles, changing the categories and modifying their abstract for resubmission to the supervisor. The supervisor can view all information regarding their current supervisees namely the group members, project’s title, abstract and their current progress as shown in Figure 2.

3.2. FYP Project Registration process
The existing/conventional FYP management process for project registration is done manually. Consequently, this process involved tedious documentation process and posed risks such as accidental deletion of student’s name or redundancy in appointing the supervisor per group. Through the implementation of oPENS, the project registration process for each group can be done quickly and easily. Firstly, students need to make pre-registration by filling in the names of their group members and supervisor in provided Google Form. The students are allowed to select/choose supervisors and each supervisor can only supervise maximum of three groups. Simultaneously, the student must register for FYP course in the Student Information Management System, (SIMS) provided by the Academic Affairs Division of UiTM. For the next process, the coordinator is the main person who will be in-charge in managing students’ registration. The coordinator is responsible to assign student’s group members and allocate supervisors for each group based on group code. When the registration is approved and verified, the students and supervisor can view the details of their allocations. The supervisors can view the list of students’ names according to group code. For example, group code A1 is for EE111 program students.
3.3. FYP Weekly Report Progress
Figure 3 shows the flowchart of weekly progress monitoring process. Formerly, the supervisees must submit weekly progress to the supervisor via FYP logbook. The drawback of using logbook is the students need to make an appointment first before meeting with supervisor. There are also cases when the students forget to bring or misplace the FYP logbook. These unfortunate events can be eliminated by using oPENs. Via oPENs, the supervisor will be able to monitor their progress through this system anytime anywhere. Supervisor can view the list of supervisees, the approval form submitted by the student and also can give verification on the proposed project and weekly report.

3.4. FYP Project Approval Form
The students are required to fill the approval form in oPENs and submit to their supervisor through the system. Figure 4 shows the flow process of the form submission. They need to write their project title, objective, and scope of project and give a brief description of the proposed system. Then, the supervisors have to review and verify the submitted proposal and give the feedback or comments to the students. There are three statuses available for this process: approved, viewed and rejected. If all the corrections are done by the students then the supervisor can set the proposal status as approved, thus the FYP proposal process is completed. This status can be viewed by both supervisor and student.

![Figure 3. The weekly report monitoring process.](image-url)
Students are required to fill out the approval form. Students have to submit the approval form to the supervisor. Does lecturer receive and view the approval form? Yes, Lecturer gives the comments/feedback. Does lecturer approve? Yes, "APPROVED" status is displayed for students. No, "DECLINE" status is displayed for students. No, Students do correction and resubmit. “PENDING” status is displayed for students.

Figure 4. The project approval form submission process

3.5. Usability Testing Development
Usability testing is a method of measuring product usability or user-friendliness for future improvement. It aims to observe people reaction after using the product, identify any errors and areas of improvement and measure how well the product responds toward these following areas such as easy to learn, efficient to use, enjoyable to use, easy to remember, and visually pleasing. The testing is focused on the system performance towards a better FYP management. Respondents will compare the designed system with the manual existing FYP management. The online FYP processes which will be tested by the respondents are: the submission of project approval, weekly report and also the online registration process. Figure 5 shows the development of usability testing. The Thinking Aloud technique is used to gather feedback from users during the test. The users will be guided to perform several tasks and the users are asked to express anything they see, think, and feel when they complete a given task. oPENs is available at standalone servers. The users will come to the testing room and observer will assist throughout the experimental process. The users are given some tasks and are guided about what they need to do. All comments and views from the users will be recorded by the observer.
After completion of the given tasks, the user must complete the survey form to give their valuable comment and view of the usability of the system. There are ten questions based on Likert scale. Likert scale of 1 to 5 is used to measure user responses where 1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree. The survey questions are as follows:

**Table 1.** Survey questions.

| No | Questions                                                                 | Components          |
|----|---------------------------------------------------------------------------|---------------------|
| Q1 | The interface of this system is pleasant.                                 |                     |
| Q2 | This system has all the functions and capabilities as expected.           | Component 1         |
| Q3 | The organization of information on the system screen is clear.            |                     |
| Q4 | The system is easy to learn and use for beginners.                       |                     |
| Q5 | I can use it without written instructions.                                | Component 2         |
| Q6 | I find the system to be flexible to interact with                         |                     |
| Q7 | Using the system in my job would enable me to accomplish tasks more quickly |                     |
| Q8 | Using the system would improve my job performance and productivity.      | Component 3         |
| Q9 | This system can enhance communication way better than existing system.   |                     |
| Q10| All the stored data can be easily retrieved.                             |                     |
4. Result and Discussion

This study aims to identify the usability of the developed FYP system. It involves system usability testing and conducting survey answered by 20 selected FKE lecturers who have experiences in managing FYP. The process begins with system testing and respondents should answer the survey questions at the end of the process. The system testing only focuses partially on online management for the submission process of project approval forms, weekly reporting management process, and group registration process. The implementation of the online system is intended to replace the existing manual systems that are less effective and require long working hours. Based on the survey questions, there are three components of the usability of the system to be measured i.e. appearance and interface, user-friendliness and system efficiency. Questions 1, 2 and 3 ask respondents to evaluate the appearance and interface of the system. As shown by the chart analysis in Figure 6, all three questions from component 1 got positive feedback from the respondents. Most of the respondents strongly agree with the system appearance and interface, while there are only 1-3 respondents who gave a neutral scale and they suggested a few improvements that can be done for future work. Here are some comments/ suggestions from respondents which are recorded during the system testing:

1. The menu button should be more noticeable and eye-catching.
2. The system should add features for uploading pictures/ pdf/ word file in the weekly report section.
3. The word limit is not enough for the students to describe their project progress.

Figure 6. Result statistics for Component 1.

It is important for the developed system to be easy to use without the need for any training. To get feedback result for this component, the respondents did the system testing without guidance from the observer. There was not much difficulty encountered during the test and Figure 7 shows about 45% of the respondents agree that the system is user-friendly. This system is easy to understand for beginners because the respondents are those who are experienced in the management of the FYP system and they can identify how to use the new system by comparing with the previous manual system. There are 10% -20% respondents who need guidance when using this system. From observations, neutral scales respondents are from senior lecturers because they are less exposed to computerized systems and most of them have been having problems in adapting to new systems, especially web-based systems. Only one respondent disagrees with the statement from Question 2; however it will not affect the system implementation because a written manual of the system is also prepared for the beginner. The analysis also shows that about 90% of respondents don’t have problem to use this system, meaning that this online system is user-friendly. For the result of the last component, all 20 respondents agree with this online management system and they hope that this system will be implemented soon in the coming
semester. To reduce existing workload, this system will help them a lot in handling their job efficiently and faster in addition to providing a better communication medium between all parties involved.

5. Conclusion and Future Work
This study aims to identify the usability of the developed FYP system. The process begins with system testing and then the respondents should answer the survey questions. Some suggestions have been obtained and will be considered for the purpose of improvement. The results of the survey found that all respondents have shown positive reaction to the development of this system due to its many advantages. Therefore, the development of this system will continue while considering the inputs and responses obtained from the survey.

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Acknowledgments
The authors acknowledge the financial assistances from Institute of Research Management & Innovation, Universiti Teknologi MARA Grant Scheme Academic & Research Assimilation (600-IRMI/DANA 5/3/ARAS (0134/2016) and Department of Research and Industrial Linkage (PIJA), Universiti Teknologi Mara (UiTM) Terengganu in SIG Grant Scheme 600-UitmKD (PIJ/RMU/ST/DANA SIG 5/2/1) Dst (15/2016).