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DEVELOPING AN ONLINE PRACTICUM EVALUATION MANAGEMENT SYSTEM

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ABSTRACT

Technology and online systems were enhancing the way people work. An online system for evaluating practicum students is vital as the number of students participating in practicum sessions each semester continues to grow. The traditional method of manual evaluation can be time-consuming and tedious for supervisors, and maintaining and organising student evaluation data can also be a challenge for the university. To overcome these issues, this study aims to create an online evaluation system named "Online Practicum Evaluation Management System". This system will enable supervisors to evaluate students quickly and easily based on the specific rubric without needing to be paper-based. Additionally, the system will provide a secure and organised platform for storing and accessing student evaluation data. This solution aims to enhance the overall efficiency and effectiveness of the practicum program. Rapid Application Developments (RAD) has been used in developing this system. There are four steps in the RAD methodology: requirements gathering, user design, construction, and cutover. Interviews and content analysis were first used to gather the functional requirements. The collected requirements were then used to create a prototype and put through a recorded usability study. The evaluation indicated that OPEMS is practical and straightforward to operate. A majority of respondents are pleased with the system's features. Researchers and developers in this field can use the study as a blueprint for creating similar designs or improving the performance of existing ones. Therefore, the proposed Online Practicum Evaluation Management System will be a more practical, well-organized, faster, reliable, and accurate means of processing the current conventional method of evaluating practicum students.

Keywords: Online Practicum Evaluation Management System, Efficiency, Rubric, Time-consuming, Rapid Application Development.

INTRODUCTION

Practicums, also known as internships or fieldwork experiences, play a pivotal role in the holistic development of students across a myriad of fields, including education, healthcare, engineering, and business. These hands-on experiences allow students to apply theoretical knowledge in real-world settings, hone practical skills, and gain valuable insights into their chosen professions. Practicums are instrumental in bridging the gap between academia and the workforce, preparing students for successful careers. Standard evaluation methods using rubrics have been prevalent for many years, and the evolution of practicum evaluation systems has brought about significant enhancements in fairness, accuracy, and relevance. Rubrics are detailed scoring guides that outline specific criteria for assessing a student's performance. This rubric provides a clear framework for evaluating skills, behaviours, and competencies, ensuring the evaluation process is transparent and consistent. Students and supervisors can refer to these rubrics to understand the expectations and standards for successful performance during the practicum.

The recent practicum evaluation process involves the utilisation of a manual evaluation rubric, which serves as a fundamental component in assessing the performance and progress of individuals engaged in practical training or internship programs. A study by Darmi et al. (2022) stated that a guideline could be used as a rubric for evaluating any innovation-related project related to teaching and learning. According to Ana et al. (2020), assessing students' skills using an observation sheet (manual rubric) is ineffective in monitoring all students and rating a manual observation sheet is relatively tricky. Apart from having to write on a sheet, the data must still be transferred to the software to archive the database (Muktiarni et al., 2019). The manual evaluation rubric, typically paper-based documents, provides a structured framework for evaluating various aspects of a participant's experience, including their skill development, organisational contributions, and overall effectiveness in the practical setting. However, paper-based systems and manual processes often lead to inefficiencies and errors.

Another challenge associated with manual evaluation rubrics is the time and effort required to administer and analyse them. Collecting and processing many rubric forms and calculating the marks, especially when the number of students increases, can be a resource-intensive task. The manual data entry and analysis processes can lead to delays in providing feedback to management and may hinder the timely implementation of necessary improvements. Converting manual evaluation rubrics into digital environments is imperative to ensure educational continuity and flexibility. This article introduces the concept of developing an Online Practicum Evaluation Management System (OPEMS), a groundbreaking initiative that promises to revolutionise how practicums are conducted, assessed, and managed. This system will enable supervisors to evaluate students quickly and efficiently without needing to be paper-based. Additionally, the system will provide a secure and organised platform for storing and accessing student evaluation data.

Information and communication technologies (ICTs) have profoundly impacted educational practices in higher education institutions over the past decade. As a result, educational systems worldwide have adapted their curricula and teaching practices to accommodate better the needs of an increasingly complex information technology infrastructure. One example is e-learning, which uses Internet technologies to enhance knowledge and performance. Online systems have greatly improved the way work is done in educational institutions. These systems have made it easier for educators, administrators, and students to access and share information, communicate, and collaborate. For example, Learning Management Systems

(LMS) allow educators to create and manage online course materials, assignments, and assessments and provide students access to these materials from anywhere with an internet connection.

Similarly, Student Information Systems (SIS) allow administrators to manage student data, such as grades, attendance, and enrolment information, in a centralised, easily accessible location. These systems also provide online registration, class scheduling, and financial aid management features. Furthermore, online methods allow for better communication and collaboration between students and educators through discussion boards, chat, and video conferencing. As a result, online systems have significantly streamlined and improved the work processes in educational institutions. The next section of this paper describes a comprehensive analysis of existing research and scholarship related to practicum evaluation. We then proceed with the methodology section, which outlines our approach to investigating practicum evaluation issues. The design and development section explains the requirements of the OPEM and the prototype of the system. Moving on to the results section, we present the findings of our research based on the survey performed. In the conclusion, we summarise the key findings, emphasising the critical importance of addressing the identified issues in practicum evaluation. We discuss the implications of our research for educators, institutions, and policymakers, highlighting the need for enhanced collaboration and innovation in this area.

LITERATURE REVIEW

Information and communication technologies (ICTs) have profoundly impacted educational practices in higher education institutions over the past decade. As a result, educational systems worldwide have adapted their curricula and teaching practices to accommodate better the needs of an increasingly complex information technology infrastructure. One example is e-learning, which uses Internet technologies to enhance knowledge and performance. Online systems have greatly improved the way work is done in educational institutions. These systems have made it easier for educators, administrators, and students to access and share information, communicate, and collaborate. For example, Learning Management Systems (LMS) allow educators to create and manage online course materials, assignments, and assessments and provide students access to these materials from anywhere with an internet connection.

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Many studies have been conducted on using online systems in educational institutions, focusing on their effectiveness, student engagement, and satisfaction. One study conducted by researchers at the Universiti Utara Malaysia (UUM) looked at the use of the UUM Online Learning System (UOLS) and found that it improved student engagement, satisfaction, and performance (Yusoff et al., 2015). The study also identified some challenges, such as a lack of technical support and difficulty navigating the system, which the researchers suggested should be addressed to improve the effectiveness of the UOLS. Other studies on online learning systems in educational institutions have highlighted the importance of providing adequate

support and resources to students and teachers to ensure a positive learning experience (Joo et al., 2015; Wang et al., 2016).

There have been numerous studies on using online systems in educational institutions, specifically student information systems (SIS) and learning management systems (LMS). One survey by Oblinger and Oblinger (2016) found that SISs are essential for managing student data and increasing efficiency in higher education institutions. Another study by Kupczynski and Leonard (2017) found that using LMSs can positively impact student engagement and achievement. A study by Chen and Bryer (2020) found that LMSs positively affect student learning outcomes when implemented and designed effectively. Having a system that aids in coordinating different parties involved in the conduct of practicum or on-the-job training is beneficial. A study by Tetteh and Dauda (2021) found that using LMS can positively impact student learning, but the choice of LMS platform can also affect the level of impact. These studies demonstrate that online systems, such as SISs and LMSs, can positively affect the management and delivery of education when implemented and utilised effectively.

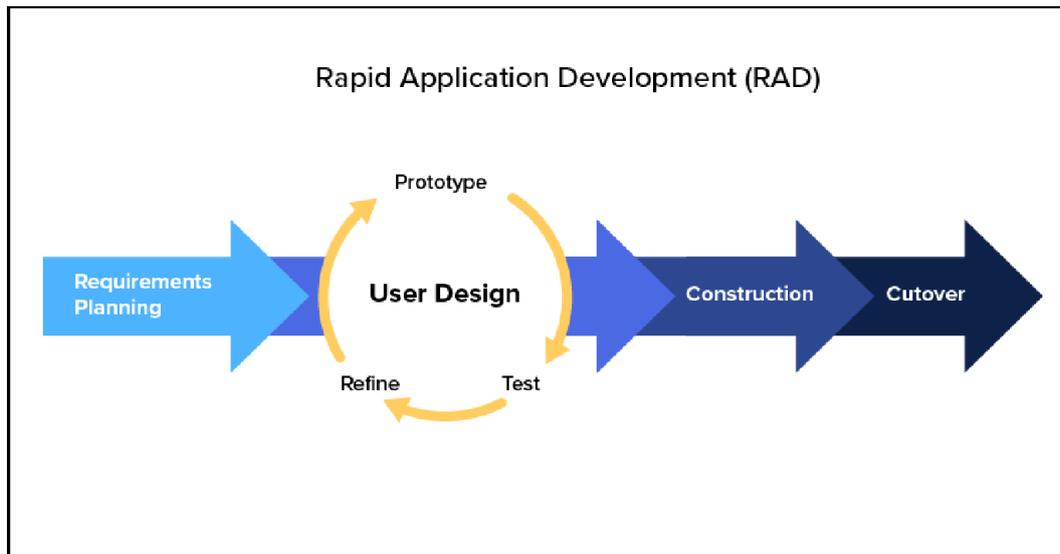
METHODOLOGY

Rapid Application Development (RAD) methodology has been selected to develop the system on a compressed schedule. Rapid Application Development (RAD) is a software development methodology that emphasises speed, flexibility, and collaboration. It is designed to deliver high-quality software quickly and efficiently by minimising the time spent on planning and documentation and maximising the time spent on development and testing. One of the critical features of RAD is the use of iterative development. This means the project is broken down into small, manageable chunks, and each piece is developed, tested, and refined before moving on to the next one. This allows for rapid prototyping, where early versions of the software are designed and tested with users to gather feedback and make improvements.

Another critical aspect of RAD is visual modelling and other tools to aid development. These tools help reduce the time spent on coding and testing and allow for more efficient collaboration between team members. RAD is also known for its strong focus on user involvement. This means that users are actively involved in the development process, from the early stages of planning to the final testing and deployment of the software. This helps to ensure that the final product meets the users' needs and is easy to use. Overall, RAD is a methodology well-suited for fast-paced development environments where time-to-market is critical, and projects are subject to frequent change. It allows for a more flexible, efficient, and user-centred development process, which can help ensure a project's success. It is an adaptive approach to information system development, covering the entire process from launch to delivery to the client. The flow of the phases is illustrated in Figure 1.

Figure 1

Rapid Application Development (RAD) Methodology



The Online Practicum Evaluation Management System (OPEMS) goes through several phases in its development, including requirements planning, user design and construction, and cutover. During the requirements planning phase, the requirements for the OPEMS are gathered. Meeting with stakeholders, such as instructors, students, and administrators, was done to understand their needs and requirements for the Practicum evaluation system. These steps also determine the core features required for the design, including user management, evaluation forms, reporting, etc. Documenting using Unified Modelling Language (UML) diagrams, such as use case and sequence diagrams, represents a system's requirements. The user design and construction phases co-occur, where the user interface of the OPEMS is designed. A requirement-gathering process utilising two distinct approaches: firstly, through interviews with a group of chosen lecturers who fulfil supervisory roles, and secondly, by analysing online educational system-related documents available on the internet. The respondent involved 25 participants, consisting of 20 lecturers and five organisational employees who serve as supervisors for internship students. Participants were approached through both personal meetings and email communication. The item measured by (Medina et al., 2022) is used to measure the developed prototype. Initial user interface and system functionality prototypes were created during prototyping development. The purpose of this stage is to ensure the prototypes are functional but need to be fully polished. Gathering feedback from users, especially instructors and administrators, to refine the design and functionality is also done in this stage. At the construction stage, the development of the modules is started by building the system in modules or components, beginning with the most critical features. Continuously testing and integrating modules was done to ensure they work well together.

Users are actively involved in this process, providing feedback to improve the interface and information flow of the system. Finally, during the cutover phase, an evaluation is conducted to measure the usability of the OPEMS. Training was given to end-users, including instructors and administrators, on how to use the new system effectively.

DESIGN AND DEVELOPMENT OF OPEMS

This section describes the design and development of the OPEMS following the first three phases of RAD. The area is divided into two sub-sections: The requirements of OPEMS and the prototype development of OPEMS.

The requirements of OPEMS

A requirement-gathering process was conducted using two methods: (1) interviewing selected lecturers who serve as supervisors and (2) analysing documents related to online educational systems from the Internet. The interviews were conducted as discussions with two supervisors to gather information on the desired functions of the system. For the secondary requirement gathering process, relevant documents were searched for on the internet using the Google search engine, specifically focusing on online systems used in higher education institutions. The list of functional requirements (and their priority) for the system is produced from the requirements-gathering process. The requirements for the OPEMS include user Registration, Login, Manage Evaluation Rubric, Manage supervisor and student list.

The requirements presented were translated into the computer system functionality. The following process visualises and models the system's requirements using suitable methods and tools. This work used the Unified Modelling Language (UML) to envision and model the requirements. The models used in this work are two interactive diagrams, namely use case and sequence diagrams, that signify the structural components of the system. The charts were drawn using the Draw.io application. Figure 2 illustrates the use case diagram and the connections between the use cases and the actor for the system. The primary use cases are Register, Login, Manage Evaluation Rubric, Manage supervisor and student list. The use case of register allowed the user to register to the application. After the registration, the user can log in to the system, and after the login, the user is allowed to manage the Evaluation Rubric. The admin can access the Manage supervisor and student list.

Figure 2

The Connections between the Use Cases and the Actor

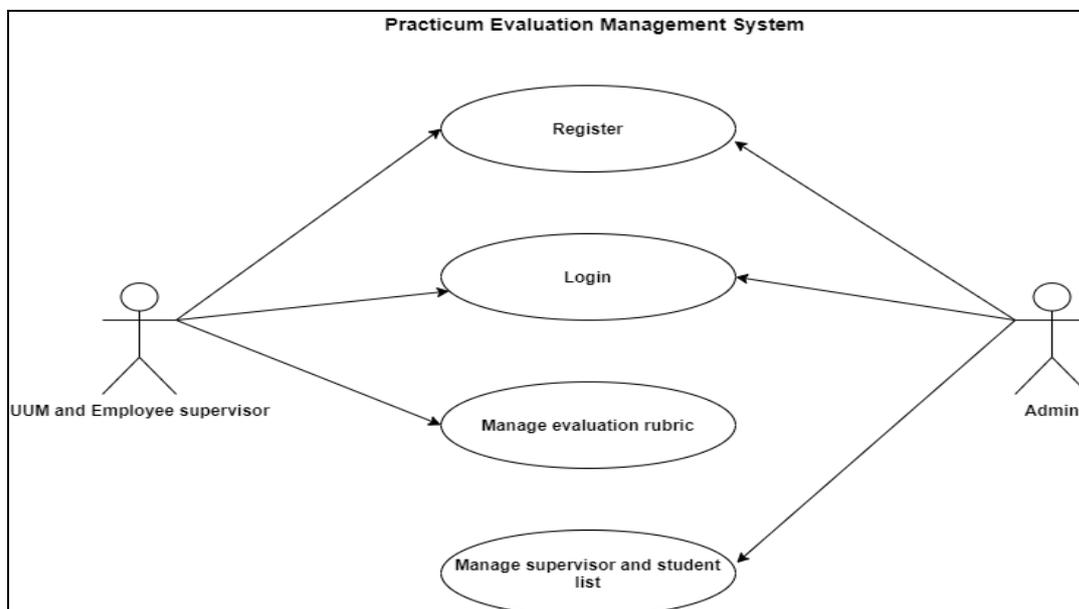


Figure 2 illustrates the use case diagram and the connections between the use cases and the actor for the system. The primary use cases are Register, Login, Manage Evaluation Rubric, and Manage supervisor and student list. The use case of register allowed the user to register to the application. After the registration, the user can log in to the system, and after the login, the user is allowed to manage the Evaluation Rubric. The admin can access the Manage supervisor and student list. The requirement was translated into the computer system functionality. The sequence diagram for the requirement shows an attribute and operation for the application, as shown in Figure 3, Figure 4, Figure 5 and Figure 6.

Figure 3

Sequence Diagram for User Registration

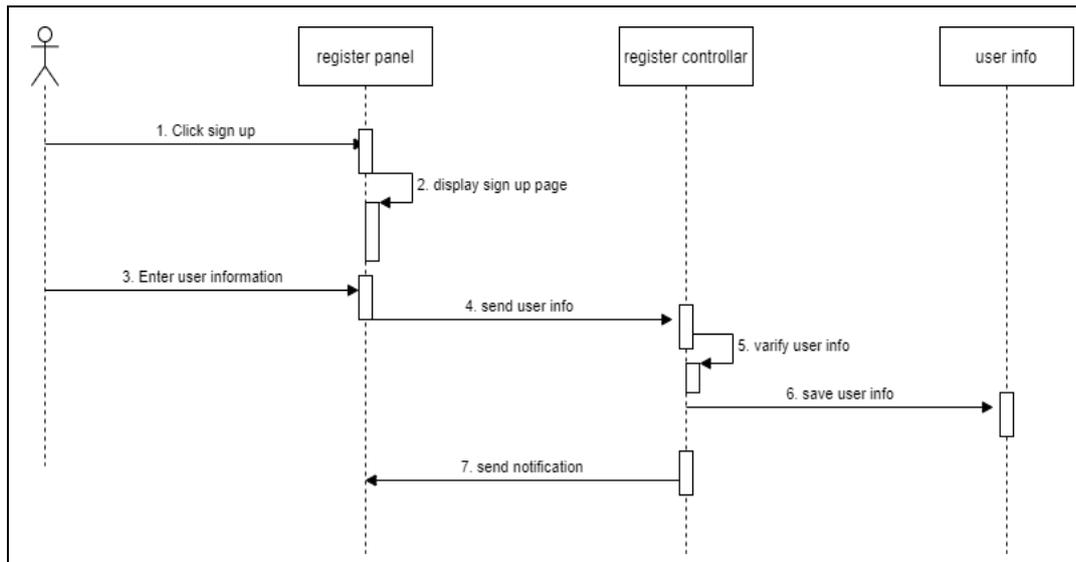


Figure 4

Sequence Diagram for Login

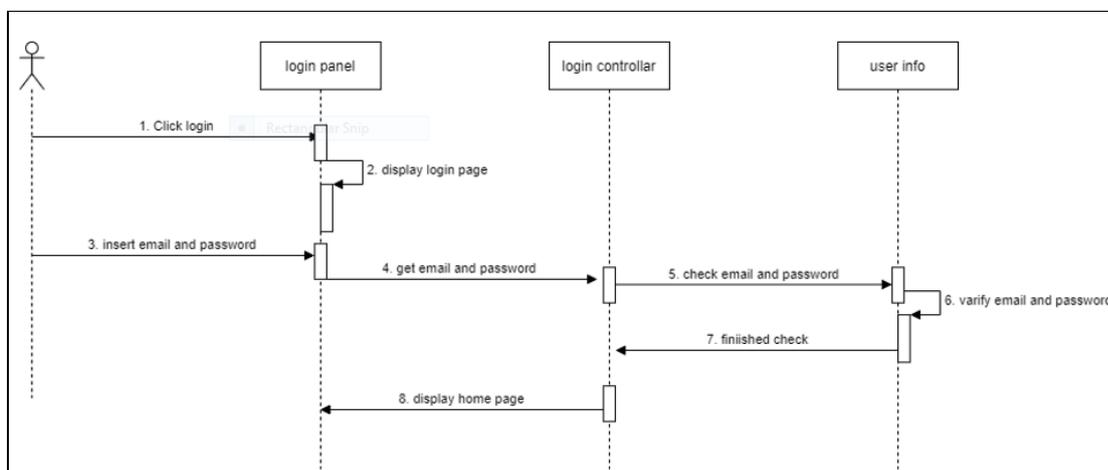


Figure 5

Sequence Diagram for Manage Rubric

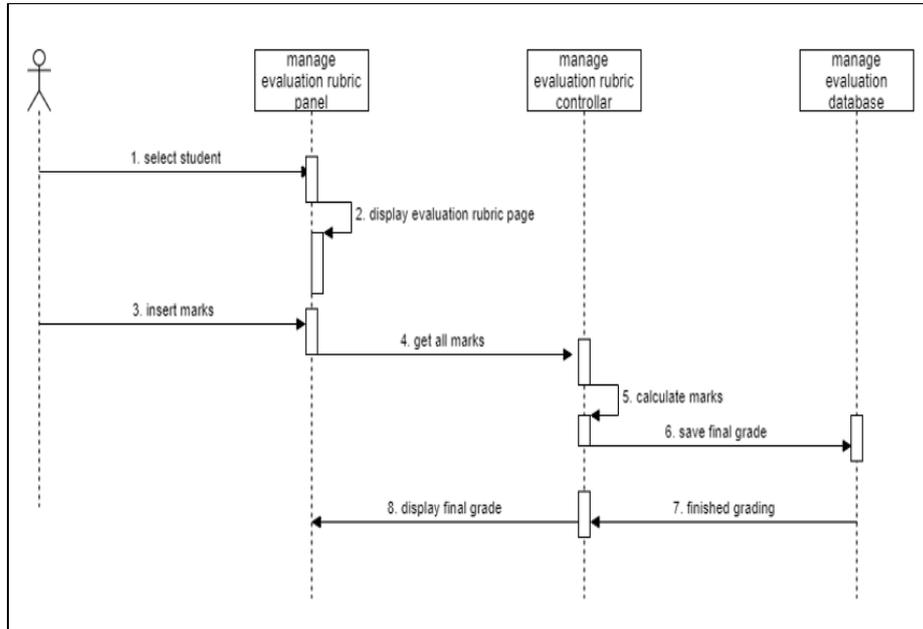
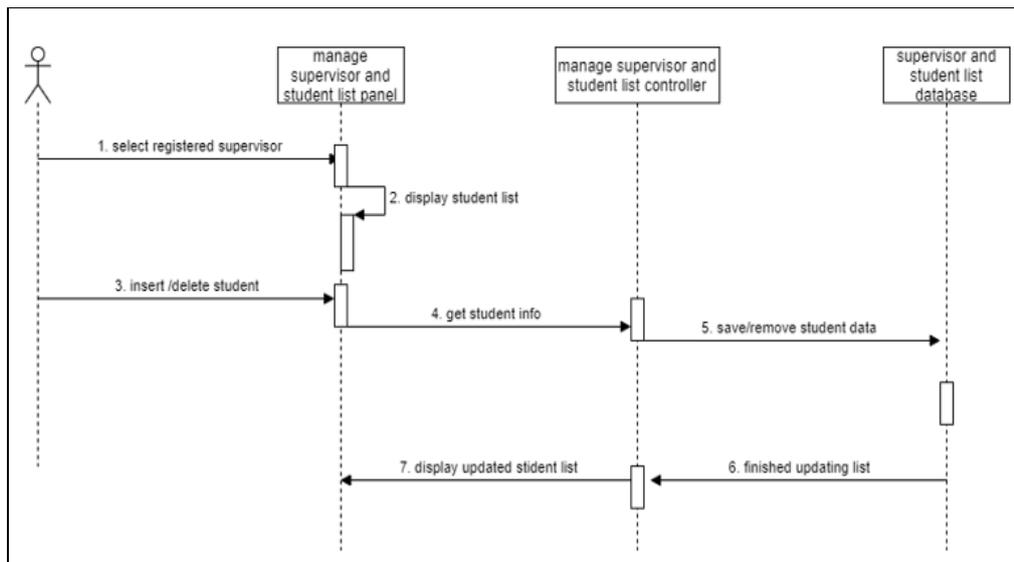


Figure 6

Sequence Diagram for Manage Supervisor and Student List



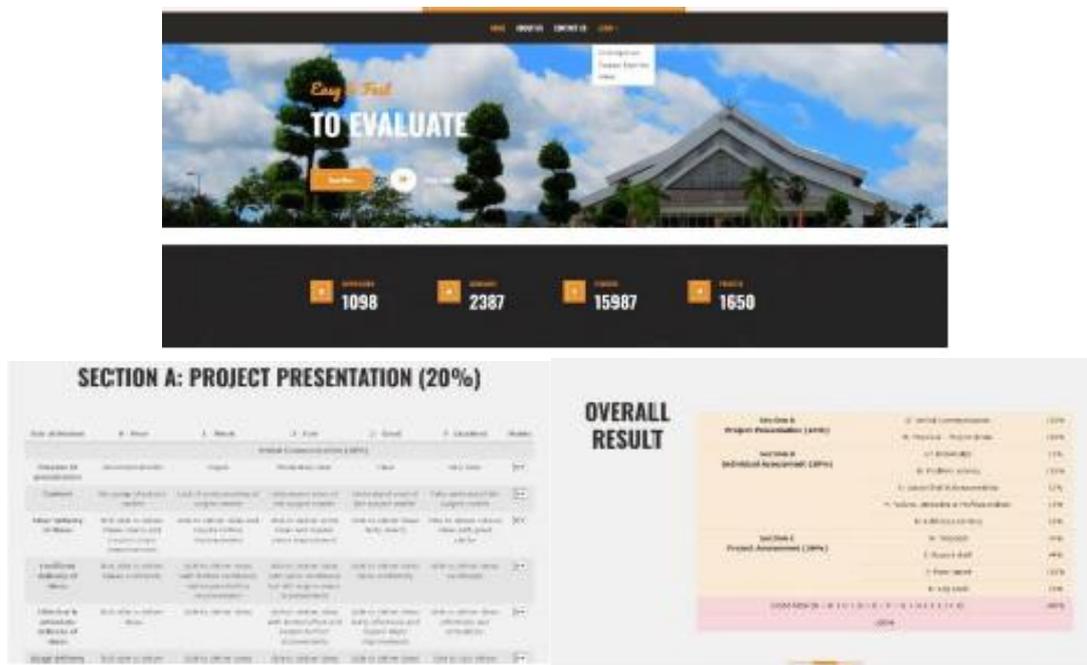
The following process is visualising and modelling the system's requirements using suitable methods and tools. This work used the Unified Modelling Language (UML) to envision and model the requirements. The models used in this work are two interactive diagrams, namely use case and sequence diagrams, that signify the structural components of the system. The charts were drawn using the draw io application.

The Prototype Development of OPEMS

The Practicum Evaluation System prototype was developed to demonstrate the software requirements and gather user feedback effectively. The prototype is a proof-of-concept for the final system, allowing users to interact with and test the proposed features. This helps to ensure that the last system will meet the users' needs and address any potential issues before the final version is developed. Visual Studio Code was the primary integrated development environment (IDE) tool to develop the prototype. This popular IDE provides a wide range of features such as code completion, debugging tools, and integrated Git control, making it well-suited for developing complex software systems. In addition to developing the prototype using Visual Studio Code, an online platform was utilised to provide user authentication and data storage. User authentication is essential to ensure that only authorised users have access to the system, while data storage is necessary to store and retrieve the data used by the system. To achieve this, the MySQL database was used to contact the system with the database. This database management system is widely used and known for its reliability, scalability, and ease of use. Screenshots of the Online Practicum Evaluation System interfaces are provided, as shown in Figure 7, to give users an idea of how the system will look and function.

Figure 7

The Screenshot of the OPEM System



These images visually represent the prototype, making it easier for users to understand and provide feedback. The prototype is valuable for gathering feedback and ensuring the final system meets users' needs.

RESULTS

The system's prototype has been evaluated by a survey based on five main components: the evaluation setting, the respondents' demographic, the ease of use, the visibility and the functionality. Each of the components is described below.

The Evaluation Setting

A usability evaluation was conducted with 25 respondents consisting of 20 lecturers and five other organisation employees who serve as internship students' supervisors. The respondents were approached via personal meetings and email. The instruments used for the evaluation were the Practicum Evaluation Management System high-fidelity prototype and a post-task questionnaire. The post-task questionnaire consists of 20 items in four sections. Section A collected demographic information, while Section B assessed the respondents' opinions on the system's ease of use using a five-point linear scale (1 representing "strongly disagree," and five representing "strongly agree"). Section C evaluated the system's visibility using the same scale as Section B. In Section D, we asked the respondents about the system's functionality using linear scale questions. The respondents performed the following step-by-step procedure for the evaluation: (1) sending the OPEMS high-fidelity prototype link to the respondents, (2) having the respondents interact with the system as outlined in the experimental procedure, and (3) having the respondents complete the post-task questionnaire.

The Respondents' Demographic Information

The data collected from the survey of respondents' demographic information shows that 56% of the participants were male and 44% female. Most respondents were between 31 to 40 years old (68%), followed by 41 to 50 years old (24%). No participants were above the age of 51. 79.2% of the participants worked at SOC UUM, while 20.8% worked at other organisations. 84% of the respondents used online systems other than UUM Portal and UUM Online Learning, while 16% did not.

The Ease-of-use of OPEMS

Table 1 below presents the findings on the ease of use of the Online Practicum Evaluation Management System.

Table 1

The Ease-of-use of OPEMS

Questions	Options	Percentage
The system is easy to use	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	5%
	Agree (4)	36%
	Strongly Agree (5)	64%
The system is user-friendly.	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	0%

	Agree (4)	32%
	Strongly Agree (5)	68%
I can easily remember how to use it	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	0%
	Agree (4)	36%
	Strongly Agree (5)	64%
I can navigate through the pages quickly and efficiently	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	4%
	Agree (4)	52%
	Strongly Agree (5)	44%
I can recover from mistakes quickly and efficiently when using the system	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	24%
	Agree (4)	60%
	Strongly Agree (5)	16%
I did not notice any inconveniences as I used the system	Strongly Disagree (1)	0%
	Disagree (2)	4%
	Neutral (3)	24%
	Agree (4)	60%
	Strongly Agree (5)	3%

Respondents were asked to rate the system on various aspects, such as ease of use, user-friendliness, flexibility, and learning. Many of the participants found the system to be easy to use (64%), user-friendly (68%), and easily memorable (64%). Most respondents agreed that they could navigate the pages quickly and efficiently (52%) and recover from errors rapidly (60%). While 24% of the participants reported no issues with the system, 60% agreed there were no inconsistencies, and 16% strongly agreed. The data indicates that the system received generally positive feedback from most participants.

The Visibility of OPEMS

The data indicates that many participants found the system visually appealing (68%) and its design aesthetically pleasing (64%). A significant number of respondents agreed (52%) that the font and text shape on the screen were legible, and 64% considered the screen layout user-friendly. 56% of the participants agreed that the information displayed on the screen was sufficient, while 20% agreed. Overall, the data suggests that most participants were satisfied with the visual aspects of the system.

The Functionality of OPEMS

Table 2 shows the findings on the functionality of the Online Practicum Evaluation Management System.

Table 2

The Functionality of OPEMS

Questions	Options	Percentage
All the functions of the system are working accordingly.	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	8%
	Agree (4)	76%
	Strongly Agree (5)	16%
I can use the system for evaluation successfully every time.	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	8%
	Agree (4)	36%
	Strongly Agree (5)	56%
I can download the document.	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	0%
	Agree (4)	16%
	Strongly Agree (5)	84%
The error message was displayed for incorrect input.	Strongly Disagree (1)	0%
	Disagree (2)	0%

Are you satisfied with using the system?	Neutral (3)	16%
	Agree (4)	56%
	Strongly Agree (5)	28%
	Strongly Disagree (1)	0%
	Disagree (2)	0%
	Neutral (3)	0%
	Agree (4)	64%
	Strongly Agree (5)	36%

The data collected from the respondents indicates that many users are satisfied with the functionality of the system and their ability to use it for evaluations. 76% of users agreed that all the system's functions were working as intended, and 56% strongly agreed that they could use the system successfully for evaluations every time. The respondents also reported no difficulties downloading documents, with 84% strongly agreeing. Error messages were displayed for incorrect actions, with 56% of respondents agreeing and 28% strongly agreeing. Additionally, 64% of users were satisfied with the system, with 36% strongly agreeing. In conclusion, most respondents positively viewed the system's functionality and expressed satisfaction.

Summary

The Online Practicum Evaluation Management System has been evaluated and found valuable and user-friendly. Respondents agreed that the visual interface is appealing, and the system is easy to navigate without requiring written instructions. They also reported that they can easily remember how to use the system. However, there were some areas for improvement identified. Respondents expressed dissatisfaction with the application's features and felt that the system needs more adequate materials for learning and handling error situations. Despite this, many respondents thought that the features offered by OPEMS are convenient for the evaluation process and that the system is well-structured. Overall, while there are some areas for improvement, respondents were generally satisfied with the functionality and appearance of OPEMS, and they provided valuable feedback that could be considered for future updates and enhancements.

CONCLUSION

An Online Practicum Evaluation Management System has been proposed to be developed to ease the process of evaluating practicum students for the Institution Supervisor and Company Supervisor. The system will save the supervisor time to assess manually and reduce the risk of losing student data while submitting the evaluation rubric. In addition to the benefits already mentioned, the online evaluation process also offers improved accuracy and consistency in evaluating students' performance. Implementing OPEMS will significantly improve traditional evaluation methods, as it allows for greater efficiency and convenience for supervisors and evaluators. With the ability to improve efficiency, accuracy, consistency, and communication, this system will likely continue to be a valuable tool for evaluating and enhancing the practicum experience for students and potentially other institutions in the future.

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