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Web-Based Student Research Defense Management System for PSU-School of Advanced Studies

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Abstract – *This study aimed to develop a Web-Based Student Research Defense Management System for the PSU–School of Advanced Studies (SAS) to address the limitations of the existing manual and paper-based defense scheduling process. The current system presents challenges such as scheduling conflicts, communication gaps, document tracking inefficiencies, and delays in approval workflows. Using a descriptive-developmental research design, the study first analyzed the existing defense procedures through structured interviews, document analysis, and process flowcharting. The system was then developed using the Rapid Application Development (RAD) methodology, incorporating iterative prototyping and user feedback to ensure that institutional requirements were met. The proposed system provides a centralized and automated platform for managing defenses scheduling, calendar integration, automated notifications, and report generation for title, proposal, and final defenses. Use case diagrams were utilized to visualize system interactions among student researchers, thesis/dissertation professors, faculty member (panel members), and the Executive Director. The system aims to improve efficiency, coordination, transparency, and documentation of the defense process within the university. Usability testing was conducted using the Website Analysis and Measurement Inventory (WAMMI) questionnaire, evaluating attractiveness, controllability, efficiency, helpfulness, and learnability. Results revealed an overall grand mean of 4.36, interpreted as Strongly Agree and Usable, indicating high user acceptance and satisfaction. The findings confirm that the developed system effectively enhances the management of student research defenses at PSU–SAS and provides a more organized, accurate, and reliable process for all stakeholders.*

Keywords – *web-based, scheduling system, defense management system, centralized schedule*

INTRODUCTION

A Defense Management System is a specialized information system designed to manage and organize the processes involved in thesis or dissertation defenses. [3] A management system refers to the set of processes and procedures used by an organization to effectively accomplish its objectives. [6][8] In the context of academic institutions, such a system ensures that all activities related to student research defenses are properly monitored, coordinated, and documented. [1]

At present, the management of student research defenses at the PSU–School of Advanced Studies (SAS) primarily relies on manual and paper-based processes. Manual processes involve human intervention in tasks such as data entry, document verification, and schedule coordination. While functional, these processes are often time-consuming, costly, and prone to errors. Multiple intermediate steps increase the risk of delays, miscommunication, and inefficiencies. [18]

The current manual system presents several challenges. First, scheduling difficulties arise when coordinating defense dates, room availability, and faculty or committee member schedules. [3] Second, communication limitations may lead to lost or misinterpreted information regarding defense requirements, deadlines, and assignments. Third, paper-based documentation creates inefficiencies in tracking proposals, revisions, feedback, and approvals, often resulting in delays and version control issues. [15]

To address these challenges, a web-based Student Research Defense Management System was developed. The system provides a centralized and automated platform that streamlines the entire defense process. The system supports scheduling through calendar integration, room assignment management, and automated notifications, and can view centralized calendar to all concerned parties. [5]

Through the implementation of this web-based system, PSU–SAS aims to improve efficiency, accuracy, transparency, and communication in managing student research defenses [10]. Ultimately, the developed system enhances the overall experience for students, faculty members, and administrators while ensuring a more organized and reliable defense management process.

OBJECTIVES OF THE STUDY

This study primarily aimed to develop and test a Web-Based Student Research Defense Management System for PSU-School of Advanced Studies. This study aimed to focus on the following specific objectives: to identify the existing Student Research defense policies and procedures, to develop a web-based system that centralizes the student research defense process; and evaluate the usability of the developed system through user feedback and system testing

MATERIALS AND METHODS

This study utilized a descriptive-developmental research design in the development of the Web-Based Student Research Defense Management System for PSU–School of Advanced Studies (SAS). The descriptive research design was employed to systematically gather, describe, and analyze the existing student research defense policies and procedures of the PSU–School of Advanced Studies. This design enabled the researchers to identify current challenges, workflow gaps, and user requirements through interviews and document analysis. [2]. On the other hand, the developmental research design was used to guide the design, development, and evaluation of the proposed web-based system. [7][13]. The system was developed using the Rapid Application Development (RAD) methodology, an agile software development approach that emphasizes iterative prototyping, user feedback, and rapid system construction to ensure efficiency and quality. [4]

The study was conducted at the School of Advanced Studies (SAS) of Pangasinan State University (PSU). The data sources were administrators, faculty members, staff, and student researchers involved in the student research defense process.

For Objective 1, the following key informants were selected through purposive sampling [11][16] to provide relevant and authoritative information regarding the current defense management process: (a) Executive Director; (b) Thesis Professor; (c) Faculty Member (Panel/Committee Member); (d) Student Researchers; and (e) Administrative Staff. These respondents were chosen because of their direct involvement in the planning, scheduling, approval, and documentation of student research defenses. The researchers conducted structured interviews with the identified respondents to gather detailed information regarding the existing processes, requirements, approval workflows, scheduling mechanisms, and documentation practices. Relevant documents such as defense guidelines, forms, and memoranda were also reviewed. To analyze and visualize the gathered data, flowcharts were created to illustrate the step-by-step manual defense management process. These flowcharts helped identify bottlenecks, redundancies, and inefficiencies in the current system.

For Objective 2, the system was developed using the Rapid Application Development (RAD) methodology. RAD consists of the following phases: Requirements Planning, User Design, Construction, and Cutover (Implementation and Testing). Use Case

Diagrams were utilized to analyze, interpret, and visualize the interactions between system users (students, advisers, panel members, and administrators) and the proposed system [9]

For Objective 3, the researchers conducted usability testing using the same respondents involved in Objective 1, namely: Executive Director, Thesis Professor, Faculty Member (Panel/Committee Member), and Student Researcher. These respondents were selected because they represent the primary stakeholders and end-users of the system. Their direct involvement in the research defense process allowed them to provide informed and relevant feedback regarding system functionality, efficiency, usability, and overall performance. The evaluation instrument used was the Website Analysis and Measurement Inventory (WAMMI) questionnaire, which measures user perceptions of website usability. The instrument assessed key usability dimensions such as Attractiveness, Controllability, Efficiency, Helpfulness, and Learnability. [17]

The responses were measured using a Five-Point Likert Scale, interpreted as follows:

Table 1. Five-Point Likert Scale

Numerical Equivalent	Statistical Range	Descriptive Equivalent Rating	Descriptive Interpretation
5	4.20 - 5.00	Strongly Agree	Usable
4	3.40 - 4.19	Agree	Usable
3	2.60 - 3.39	Neutral	Usable
2	1.80 - 2.59	Disagree	Not Usable
1	1.00 - 1.79	Strongly Disagree	Not Usable

The collected responses were tabulated and analyzed using the weighted mean to determine the overall usability rating of the system. The computed mean scores were then interpreted based on the descriptive equivalents and corresponding usability interpretations. The results of the usability evaluation served as the basis for identifying necessary system improvements and validating whether the developed system effectively supports the student research defense management process of the PSU–School of Advanced Studies. [14]

The researchers ensured that participation of respondents was voluntary, proper permission was secured from the PSU–School of Advanced Studies, all gathered information was treated with confidentiality, and data collected were used solely for academic and research purposes.

RESULTS AND DISCUSSION

The Pangasinan State University, School of Advanced Studies uses the traditional defense scheduling system. By conducting the interview, the researchers were able to gather data to identify the policies and procedures, and challenges in the existing defense system. Based on the data gathered, figure below illustrates the following the producers to thesis and dissertation schedule system.

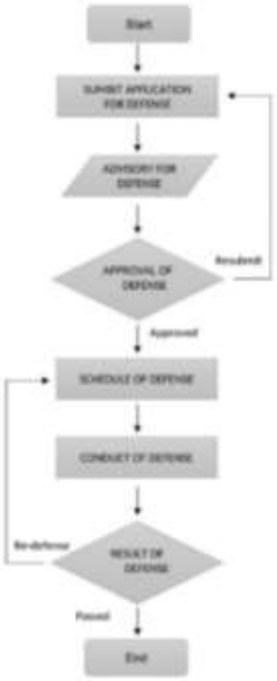

Figure 1. Existing Research Defense Scheduling Process Flow

The process flow diagram shows in Figure 1 presents a structured and systematic procedure for managing the defense application within the PSU-School of Advanced Studies. The process begins when a research student submits an application for defense to the Thesis or Dissertation Professor, which then undergoes an advisory review to ensure readiness and compliance with requirements. Following this review, the application proceeds to the approval of the SAS Executive Director. If the defense is not approved, the student is required to resubmit the application. Once approved, the defense is officially scheduled and afterwards conducted. After the conduct of defense, the results are evaluated. If the student passes, the process concludes successfully. However, if the panel recommends a re-defense, the process loops back to the scheduling stage, allowing the student another opportunity for evaluation.

Figure 2. Use Case

The use case diagram shown in Figure 2 reflects a structured and role-driven workflow within the Web-Based Student Research Defense Management System for PSU-School of Advanced Studies. Actors are Student Researchers, Thesis/Dissertation Professor, Faculty as the Panel Members and Executive Director. The process begins with the Thesis/Dissertation Professor submitting the student's Application for Defense, indicating that the professor serves as the initiating authority who verifies the student's readiness prior to formal evaluation. The Executive Director then reviews and approves the application, demonstrating an administrative validation layer that ensures compliance with institutional standards before proceeding.

Upon approval, the Executive Director assigns panel members and checks their availability, highlighting the system's built-in coordination mechanism to avoid scheduling conflicts. If the application is approved and panel members are confirmed, the Thesis/Dissertation Professor proceeds to plot the schedule of defense by verifying available dates and times.

Once scheduled, panel members are automatically notified and can view the defense schedule through the system calendar. Furthermore, the system allows both the Thesis/Dissertation Professor and the Executive Director to generate reports related to title defense, proposal defense, and final defense.

In terms of usability testing of the developed system, here are five (5) number of respondents taken part in this study's usability testing. The group of respondents consists of the Executive Director, Thesis/Dissertation Professor, Faculty Member as Panel Member, and Student Researchers.

The researchers used the WAMMI questionnaire the level 1- strongly agree, 2- disagree, 3- neutral, 4- agree, and 5- strongly agree to determine if the requirement specifications are met. The usability of the developed system was evaluated in terms of (a) Attractiveness, (b) Controllability, (c) Efficiency, (d) Helpfulness, and (e) Learnability.

Table 2. Result of Usability Testing

Dimension	Overall Mean	Descriptive Rating	Descriptive Interpretation
Attractiveness	4.60	Strongly Agree	Usable
Controllability	4.04	Agree	Usable
Efficiency	4.33	Strongly Agree	Usable
Helpfulness	4.40	Strongly Agree	Usable
Learnability	4.42	Strongly Agree	Usable
Grand Mean	4.36	Strongly Agree	Usable

The overall results of the usability testing, shown in Table 7, indicate that the web application is usable in terms of attractiveness, controllability, efficiency, helpfulness, and learnability. This means that the system meets the needs of the end users and follows the required processes for monitoring and evaluation.

CONCLUSION AND RECOMMENDATION

Based on the gathered data, and results, significant syntheses were established. The current Student Research Defense process is conducted manually and involves multiple steps requiring coordination among professors, administrators, panel members, and students. While the process is structured, it presents challenges such as scheduling conflicts, delays in approval, miscommunication, and time-consuming report preparation. These limitations highlight the need for a centralized and automated system to improve efficiency, accuracy, and overall coordination.

The SAS Student Research Defense Management System is a web-based platform that manages and simplifies the thesis and dissertation defense scheduling process. It provided platform to submit schedule the defense of student researchers for the executive director to approve, and faculty members to view schedules and confirm availability. Additionally, it helps the Thesis or Dissertation Professors to check availability of schedules. The system centralizes scheduling, panel assignment, and reporting to ensure an organized and efficient defense management process.

The usability evaluation results show that the developed web-based Student Research Defense Management System is highly usable and positively accepted by users. It performed well in terms of attractiveness, controllability, efficiency, helpfulness, and learnability, with respondents expressing strong agreement across all areas. With a grand mean of 4.36, the findings confirm that the system effectively meets user needs and supports the research defense management process.

The following recommendations are presented to guide future interventions and enhance development of respondents: to cover the whole Student Research Defense Management System, it is recommended for the future development to integrate scoring card of defense to automate the result of each defense conducted. Lastly, to get the maximum usability satisfaction of the system, it is best to pilot test by actual implementation of the defense scheduling.

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