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Research Repository System for Greater Research Accessibility for Senior High School Students in Alaminos City Division

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ABSTRACT

Limited access to completed research outputs remains a common challenge among senior high school students, especially in public school divisions where research papers are often stored manually, kept in separate schools, or made available only through limited physical archives. This study aimed to design, develop, and evaluate a web-based Research Repository System that would promote greater research accessibility within the Alaminos City Division. Specifically, the study sought to provide a centralized and secure digital platform where approved research papers could be uploaded, organized, searched, and retrieved by authorized users such as students, teachers, and research coordinators.

The study employed a descriptive-developmental research design. The developmental aspect focused on the planning, design, coding, testing, and deployment of the repository system, while the descriptive aspect involved evaluating the quality and acceptability of the system based on the ISO/IEC 25010 software quality model. The system was assessed in terms of functionality, performance efficiency, usability, reliability, and security. Data were gathered from selected evaluators who examined the system's features, ease of use, response time, dependability, and protection of stored research documents.

Results showed that the developed Research Repository System received excellent ratings across the evaluated software quality criteria. The system was found to be functional, user-friendly, efficient, reliable, and secure. These findings indicate that the proposed system can effectively address the problem of limited research access by providing a structured, accessible, and sustainable digital archive for completed senior high school research outputs.

In conclusion, the web-based Research Repository System supports improved research engagement by making previous studies easier to locate and use as references. It also helps strengthen research culture, knowledge sharing, and academic collaboration within the Alaminos City Division.

Keywords: Research Repository System, Research Accessibility, Senior High School, Web-Based System, ISO/IEC 25010

INTRODUCTION

Research competency is a fundamental requirement in senior high school education, as it develops learners' analytical skills, academic discipline, and preparedness for higher education. Despite this importance, access to completed and approved research papers remains limited in many public school divisions. Most research outputs are stored in printed form or scattered across individual schools, making retrieval inefficient and restricting students' exposure to existing local studies.

Within the Alaminos City Division, teachers and students experience recurring difficulties in locating prior research works for reference. The absence of a centralized digital repository often results in repeated research topics, limited utilization of previous findings, and delays during the research process. These challenges

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highlight the need for a structured and accessible system that supports research continuity and informed topic selection.

Advancements in web-based information systems provide opportunities to improve research management and accessibility. Digital repositories have been shown to enhance information retrieval, preserve academic outputs, and promote knowledge sharing. In response to these needs, this study focuses on the development of a Research Repository System designed to centralize senior high school research papers and provide secure, efficient access for authorized users within the Alaminos City Division.

METHODOLOGY

Research Design

This study employed a descriptive-developmental research design. The descriptive component focused on gathering data regarding the current practices, challenges, and requirements in managing senior high school research outputs in Alaminos City Division. The developmental component involved designing, developing, and evaluating the Research Repository System to improve accessibility, organization, and retrieval of research papers.

The system was developed using the Agile methodology, which emphasizes iterative design, continuous feedback, and incremental improvements to meet user requirements effectively. The development cycle followed six key phases: Requirements, Design, Development, Testing, Deployment, Review (see Figure 1). Each phase was carefully executed to ensure that the final system aligns with the needs of students, teachers, and supervisors.

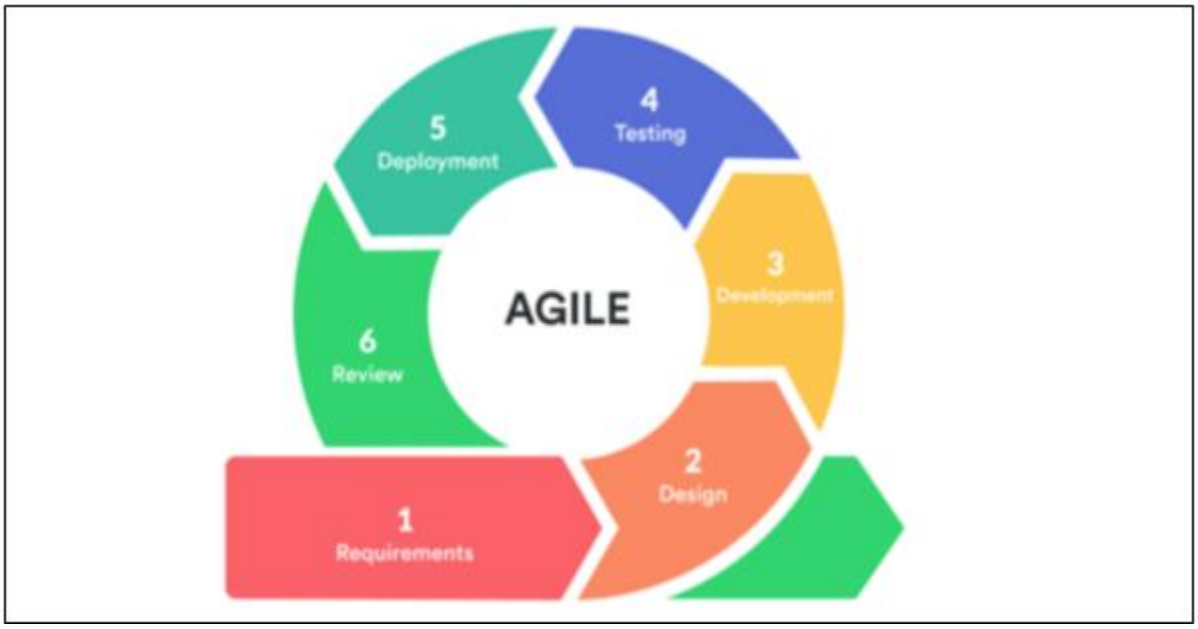

Figure 1: Agile Methodology

The proponents conducted data gathering across the nine public senior high schools under the Alaminos City Division, which served as the primary location of the study. Information was collected from individuals who are directly involved in research management, including students, teachers, research coordinators, and IT personnel. All information gathered was handled with strict confidentiality to ensure the privacy of all participants.

Primary data were collected through interviews with research coordinators and teachers to understand current archiving workflows and identify existing challenges. Surveys were conducted with students to capture their experiences in accessing and retrieving research materials. In addition, direct observations were carried out to assess the manual processes currently used within schools and the division office. Secondary data were gathered from credible online sources, including scholarly articles, journals, and related literature, to provide context and support the conceptual and technical foundations of the system.

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The proponents used purposive sampling to select respondents who had relevant knowledge and experience with the division's existing research management system. Their feedback and insights played a vital role in guiding the system's design, planning, and workflow improvements. Technical advice from IT experts further supported the development of a functional and feasible system.

Population and Data Collection

The study involved 87 respondents from nine public senior high schools under the Alaminos City Division, including 57 students, 25 teachers, and 5 research coordinators. Purposive sampling was used to select participants with direct experience in research submission, archiving, and retrieval.

Data collection methods included structured surveys to assess current practices and system acceptability, semi-structured interviews with research coordinators and IT experts, direct observations of manual research archiving processes, and document analysis of existing research policies, guidelines, and records.

Table 1: Respondents of the Study

Participant Type	Number of Respondents
Students	57
Faculty	25
Research Coordinator	5
Total	87

Data Analysis and System Development Tools

Quantitative data from acceptability surveys were analyzed using the Weighted Mean and a 5-point Likert scale based on ISO 25010 quality characteristics. The scale ranges from 1 (Poor) to 5 (Excellent), with an acceptance threshold of 3.4.

The system was developed using PHP Laravel Framework for backend logic, MySQL for database management, and Bootstrap/Tailwind CSS for frontend design. Development tools included Visual Studio Code, XAMPP, Figma, and Draw.io.

System Development Procedure

The Research Repository System was developed in the following stages:

1. Requirement Gathering – Identified functional and non-functional requirements through interviews, questionnaires, and document review.
2. System Design – Created Entity-Relationship Diagrams (ERD), database schema, and interface mockups to visualize the system structure.
3. Implementation – Developed the system using Laravel, Bootstrap,Tailwind, MySQL. Features include user authentication, research upload/download, search functionality, and access controls.
4. Testing – Conducted unit testing, integration testing, and user acceptance testing to ensure functionality, performance, and usability.
5. Deployment and Feedback – The system was deployed for pilot use, and feedback from participants was collected to identify areas for improvement.

Data Analysis

The information gathered from respondents was analyzed using descriptive statistics, particularly the weighted mean, to assess the effectiveness and overall quality of the Research Repository System. Each system attribute was rated on a 5-point Likert scale, defined as follows:

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1 = Poor

2 = Fair

3 = Satisfactory

4 = Very Evident

5 = Highly Evident

The evaluation focused on the following attributes of the system:

Functional Sustainability – the ability of the system to perform tasks consistently without errors.

Performance Efficiency – responsiveness of the system, processing speed, and use of resources.

Compatibility – capacity of the system to function across different devices and operating environments.

Usability – user-friendliness, clarity of navigation, and overall user satisfaction.

Reliability – consistency in performance under normal operating conditions.

Security – the effectiveness of measures protecting sensitive data and controlling access.

Maintainability – ease of updating, correcting, or improving the system.

Portability – the system's ability to be transferred or adapted to other environments.

The weighted mean for each attribute was calculated using the following formula:

Formula $\bar{x} = \frac{\sum_x w}{n}$

Where

$\bar{x}$ = mean

x = number of respondents

w = weight

n = total number of respondents

The mean scores were then interpreted according to the 5-point scale to determine how strongly each attribute was demonstrated by the system. An overall weighted mean was also computed to provide a general measure of the system's effectiveness.

For example, a weighted mean of 4.75 indicates that respondents considered the system to be Highly Evident in meeting its intended functions and requirements. Attributes with mean values above 4.70 are considered excellent, reflecting a system that is reliable, efficient, and easy to use.

This method of analysis ensures that the Research Repository System was thoroughly evaluated across both functional and non-functional dimensions, providing a clear understanding of its performance and usability from the perspective of its users.

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RESULTS AND DISCUSSION

The Research Repository System was evaluated based on eight software quality attributes: Functional Sustainability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. Respondents, including senior high school students, research teachers, and supervisors, rated the system using a 5-point Likert scale. The results are summarized in Table 2.

Table 2: Summary of the Evaluation

Portability	**Rate**	**Description**
1. Functional Sustainability	4.77	Highly Evident
2. Performance Efficiency	4.75	Highly Evident
3. Compatibility	4.73	Highly Evident
4. Usability	4.74	Highly Evident
5. Reliability	4.72	Highly Evident
6. Security	4.77	Highly Evident
7. Maintainability	4.74	Highly Evident
8. Portability	4.74	Highly Evident
Weighted Mean	4.75	Highly Evident

Discussion of Results

The evaluation indicates that the Research Repository System is highly effective in supporting the management and accessibility of senior high school research papers. The highest-rated attributes were Functional Sustainability and Security (4.77), reflecting that the system reliably performs the required tasks and safeguards sensitive data, such as student research submissions and access credentials.

Performance Efficiency received a weighted mean of 4.75, suggesting that the system processes tasks promptly and handles multiple user requests without significant delays. Attributes such as Compatibility, Usability, Reliability, Maintainability, and Portability scored above 4.70, demonstrating that the system is user-friendly, adaptable across devices, consistent in performance, easy to maintain, and transferable to different environments if needed.

The overall weighted mean of 4.75 signifies that the system meets the intended functional and non-functional requirements. Respondents highlighted that features such as the search and retrieval functions, upload/download processes, and access control mechanisms significantly improved research management efficiency within the division.

These results align with the study's objectives to provide greater accessibility, organization, and security for senior high school research outputs. The positive evaluation also indicates that the system has potential for adoption across schools in the Alaminos City Division, supporting teachers and students in conducting and managing research more effectively.

CONCLUSION

The developed Research Repository System offers a practical and effective solution to the limited accessibility of research materials among senior high school students in the Alaminos City Division. The system provides a centralized digital archive that improves research retrieval efficiency while ensuring secure access to academic documents. Based on the evaluation results, the system meets high standards of software quality and user satisfaction.

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The implementation of the system is expected to strengthen research engagement, promote continuity in academic studies, and support evidence-based learning within the division. Future improvements may include system integration with other educational platforms and expansion to accommodate additional schools or divisions. A larger and more diverse group of evaluators, including students, teachers, and IT administrators, should be involved to improve the reliability of system evaluation results. Future research should incorporate usability testing with real users over an extended period to assess actual system adoption and engagement levels. Additionally, adding quantitative usage analytics, such as login frequency, search success rates, and document retrieval patterns, would provide stronger evidence of system effectiveness.

The Research Repository System developed in this study provides an effective solution to the problem of limited research accessibility among senior high school students in the Alaminos City Division. The system centralizes research outputs, improves retrieval efficiency, and ensures secure access to academic materials. Evaluation results confirm that the system meets high standards of software quality and user satisfaction.

The implementation of the system is expected to enhance research engagement, reduce duplication of research topics, and support informed academic decision-making. Future enhancements may include integration with other educational platforms and expansion to additional school divisions.

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ETHICAL CONSIDERATION

Ethical Approval: This study involved human participants in the evaluation of the Research Repository System. Ethical approval was obtained from the Pangasinan State University – Alaminos City Campus Research Ethics Committee, ensuring that all procedures adhered to ethical standards, including informed consent, voluntary participation, and confidentiality of participant information.

Conflict of Interest: The authors declare that there are no conflicts of interest related to the design, development, or evaluation of the Research Repository System.

Statement: The data generated and analyzed during the development and evaluation of the Research Repository System are not publicly available due to privacy and confidentiality considerations involving student and educator records. Access to the data may be granted upon reasonable request to the corresponding author, provided that ethical guidelines and institutional approvals are observed.

Revised Manuscript: All reviewers' comments have been carefully addressed in this revised manuscript. Changes have been made throughout the document to clarify methodology, expand discussions, and improve presentation of results. A detailed response letter accompanies this resubmission, outlining how each comment was considered and incorporated.