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SCHOOL-BASED WEB ACCESS TO RESEARCH DIRECTORY WITH DESCRIPTIVE ANALYTICS

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Abstract: This study presents the development and evaluation of a School-Based Web Access to Research Directory with Descriptive Analytics for Colegio de Sta. Ana de Victorias (CSAV), designed to address the growing need for a centralized, efficient, and accessible system for managing research information within the institution. The system were developed to serve administrators, faculty, and students by providing a well-organized repository of research outputs that supports both published and unpublished studies. Its key features include search and filter functions, duplication detection, abstract previews, and a descriptive analytics dashboard that enables users to monitor research trends and institutional performance in a systematic manner. These functions were integrated to improve the retrieval, organization, and analysis of research data, reduce redundancy, and enhance access to academic resources. The system was developed using the Agile methodology, allowing iterative improvements based on user needs and feedback throughout the development process. To evaluate its quality, the study employed the ISO/IEC 25010 software quality model, with particular attention to usability, security,

functionality, and overall performance. The evaluation results showed that the system was user-friendly, secure, and effective in managing research records. It also demonstrated usefulness in streamlining research organization and retrieval, while supporting data-driven decision-making through descriptive analytics. Overall, the study concludes that the proposed system enhances research management, collaboration, accessibility, and institutional efficiency at CSAV, making it a practical digital solution for strengthening academic research operations.

Keywords: Research Directory, Descriptive Analytics, Web-Based System, Research Repository, Academic Research Management, ISO/IEC 25010

I. INTRODUCTION

In today's academic and research landscapes, effectively managing and utilizing data is crucial for fostering innovation and collaboration (Smith & Johnson, 2020). A Research Directory serves as a comprehensive system designed to organize and store information about research projects, publications, and researcher profiles, thereby facilitating easier access to essential academic resources (Smith & Johnson, 2020). This system enhances institutional information sharing, boosts the visibility of scholarly work, and promotes networking among researchers across diverse disciplines (Smith & Johnson, 2020).

This study focuses on analyzing historical data to uncover patterns, trends, and actionable insights, which play a vital role in this context (Lee et al., 2021). When integrated with research directories, descriptive analytics provides a clearer overview of an institution's research output, highlights active research domains, and identifies key contributors (Lee et al., 2021).

Research has shown that digital research directories play a significant role in enhancing collaboration within higher education by linking departments and faculties through centralized databases (Smith & Johnson, 2020). These studies have primarily focused on the technical aspects of developing these directories, offering limited examination of how the data can be analyzed to provide meaningful insights (Smith & Johnson, 2020).

Despite these studies having contributed valuable knowledge, several gaps remain in the current literature (Smith & Johnson, 2020). Research on the complete integration of digital directories with advanced descriptive analytics is limited, which restricts deeper exploration of research patterns, collaboration networks, and institutional performance (Lee et al., 2021). Most existing studies emphasize basic metrics like publication counts and citation indices, often overlooking important factors such as funding allocation, interdisciplinary research efforts, and researcher engagement levels (García & Torres, 2022).

To address these gaps, this study aims to develop a centralized research directory system with integrated descriptive analytics to improve the organization and accessibility of research data. The system will store and manage research materials efficiently while providing analytical tools to identify trends, patterns, and gaps. It will support data-driven decision-making, enhance collaboration among researchers, and improve institutional research performance. The platform will be designed to be user-friendly and accessible to both novice and experienced researchers, promoting academic growth and efficiency.

Objectives of the Study

The main objective of this capstone project was to develop and implement a School-Based Web Access to Research Directory with Descriptive Analytics.

Specifically, the study aimed to:

1. Develop a system that will:
 - a) Provide a research repository with search and filter;
 - b) Provide descriptive data analytics for monitoring;
 - c) Monitor research duplication;
 - d) Provide an abstract as an overview of research;
 - e) Track and monitor published and unpublished researches of faculty and students;
2. Determine the quality of the developed application based on the IT experts' testing using the ISO/IEC 25010:2011 Software Quality Model Criteria.
3. Determine the quality in use of the developed system in terms of effectiveness, efficiency, satisfaction, freedom from risk, and context coverage.

II. MATERIALS AND METHODS

This chapter outlines the methodology employed for this research. It describes the researcher’s use of an agile developmental approach, which guided the iterative process to develop the system.

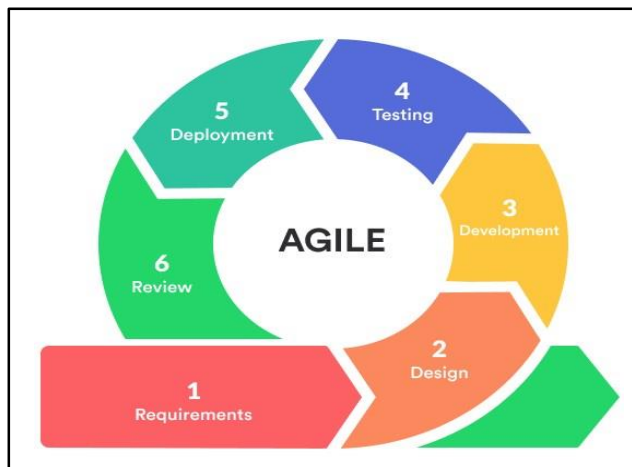


Figure 1. *Software Development Life Cycle*

Figure 1 shows the methodology used in the development of the proposed system. The researchers used process models of the System Development Life Cycle known as the Agile Approach Model. The approach model anticipates changes and allows for much more flexibility than traditional methods. The process involves breaking down each project into prioritized requirements and delivering each individual within an iterative cycle.

Requirements. This phase gathers and analyzes system requirements for the school-based web access to the research directory with descriptive analytics. Key needs include tracking published and unpublished research, monitoring duplication, and integrating descriptive analytics.

Design. This phase is dedicated to architecting the school's research directory, incorporating descriptive analytics. Key activities include designing the user interface, defining data models, and mapping out system workflows.

Development. This phase is where the software comes to life. For the web-based research directory with descriptive analytics, this involves programming the application, configuring the database, and integrating analytics functionalities.

Testing. In this crucial phase, the system undergoes rigorous testing to ensure it meets all specified requirements. For the school's research directory, this includes verifying accurate tracking of published and unpublished research, monitoring research duplication, and confirming the correct operation of all descriptive analytics functions.

Deployment. This phase involves making the software increment available to users may which vary depending on the project requirements, configuring, integrating, and deploying the software in a production environment.

Review. Review phase evaluates the delivered increment and gathering feedback from users. The feedback is for identifying areas of improvement, addressing any issues or concerns, and refining the product backlog for future iterations.

Data Gathering and Procedures. The researchers used semi-structured interviews to collect data from participants. This method allowed participants to share their experiences and perspectives in detail. After the interviews, the collected data were analyzed using thematic analysis to identify common patterns and important themes from the responses.

III. RESULTS AND DISCUSSION

After a thorough evaluation of the experts and respondents, the following were discovered:

Table 1. *Level of User Acceptability in terms of School-Based Web Access to Research Directory with Descriptive Analytics*

Criteria	Mean	Interpretation
Provide a research repository with search and filter	4.0	Strongly Agree
Provide descriptive data analytics for monitoring	4.0	Strongly Agree
Monitor research duplication	3.6	Strongly Agree
Provide an abstract as an overview of research	3.6	Strongly Agree
Track and monitor published and unpublished research of faculty and students	3.6	Strongly Agree
Grand Mean	3.76	Strongly Agree

Table 1 shows the effectiveness of the system’s function as stated in several factors. Overall, the system got a mean of 3.76 which was interpreted as strongly agree. Among the statements, the “provide research repository with search and filter” and “provide descriptive data analytics for monitoring” got the highest mean score (M=4.0), while both “monitor research duplication”, “provide abstract as overview” and “track and monitor published and unpublished research of faculty and students” got the lowest mean (M=3.6), but still interpreted as strongly agree.

Table 2. *Level of User Acceptability In terms of determining the quality of the developed system based on ISO/IEC 25010:2011 Systems and Software Quality Requirements and Evaluation (SQuaRE) Quality Model.*

Criteria	Mean	Interpretation
Functional suitability	3.4	Very Satisfied
Performance efficiency	3.5	Very Satisfied
Compatibility	3.6	Very Satisfied
Usability	3.5	Very Satisfied
Reliability	3.5	Very Satisfied
Security	3.6	Very Satisfied
Maintainability	3.5	Very Satisfied
Portability	3.5	Very Satisfied
Grand Mean	3.5	Very Satisfied

Table 2 shows the overall result of the assessment evaluated by the three IT experts based on ISO/IEC 9126-1:25021 Software Quality which resulted in the grand mean of 3.5, interpreted as very satisfied. The results showed that the system met the standard quality and performance based on the requirements.

Table 3. *Level of User Acceptability in Terms of the usability of the developed system in terms of usefulness, satisfaction, ease of use, and learning.*

In Terms of usefulness, satisfaction, ease of use, and learning	MEAN	Verbal Interpretation
Effectiveness	3.3	Satisfied
Efficiency	3.6	Very Satisfied
Satisfaction		
Usefulness	3.6	Very Satisfied
Trust	3.6	Very Satisfied
Pleasure	3.6	Very Satisfied
Freedom from risk		
Economic risk mitigation	3.6	Very Satisfied
Health and safety risk mitigation	3.6	Very Satisfied
Environmental risk mitigation	3.6	Very Satisfied
Context coverage		
Context completeness	3.3	Satisfied
Flexibility	3.3	Satisfied
Grand Mean	3.5	Very Satisfied

Table 3 shows the overall result of the assessment evaluated by the three IT experts focused on the Level of User Acceptability in terms of the usability of the developed system, namely usefulness, satisfaction, ease of use, and learning resulted in a grand mean of 3.5, interpreted as Very Satisfied. The result showed that the system met the standard quality in terms of usefulness, satisfaction, ease of use, and learning.

IV. SUMMARY OF FINDINGS

Based on the detailed presentation, discussion, interpretation, and analysis of research findings, the following summary is hereby presented:

1. The system's function to provide a research repository with search and filter capabilities has a mean of 4.0, interpreted as Strongly Agree.
2. The system's function to provide descriptive data analytics for monitoring has a mean of 4.0, interpreted as Strongly Agree.
3. The system's function to monitor research duplication has a mean of 3.6, interpreted as Strongly Agree.
4. The system's function to provide an abstract as an overview of research has a mean of 3.6, interpreted as Strongly Agree.
5. The system's function to track and monitor published and unpublished research has a mean of 3.6, interpreted as Strongly Agree.

V. CONCLUSIONS

Based on the extensive evaluation, the researchers concluded that the School-Based Web Access to Research Directory with Descriptive Analytics was a success for the following reasons:

1. The system was evaluated as highly usable, effective, and meeting high standards of software quality and security, confirming its overall success.
2. It established a centralized digital repository that streamlined the organization, retrieval, and management of academic research for the entire institution.
3. The integrated descriptive analytics provided valuable, data-driven insights into institutional research trends and output.
4. It incorporated robust mechanisms for tracking research and safeguarding academic originality, ensuring a secure platform.
5. The platform significantly enhanced the visibility of scholarly work and fostered a more data-informed and transparent research environment.

VI. RECOMMENDATIONS

Based on the findings and conclusions reached, the following suggestions are made:

1. Enhance analytical capabilities by integrating machine learning algorithms for predictive insights and implementing a multi-layered plagiarism detection system combining API services with NLP-based text analysis.
2. Develop a cross-platform mobile application using the React Native framework to provide comprehensive mobile access to research resources and analytical dashboards.
3. Implement collaborative research tools featuring real-time shared workspaces with WebSocket support and structured discussion forums with moderation capabilities.
4. Establish a comprehensive system monitoring through centralized logging implementation using the ELK stack for security auditing and performance optimization.
5. Future researchers should develop transformer-based models for automated trend classification and abstractive summarization within research directories.

CONFLICTS OF INTEREST

The author declares that for this article she has no actual, potential or perceived conflict of interests. Financial disclosure: The research work is funded by the researcher.

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