ThesisVault: A Smart Repository System for Preserving and Accessing Academic Research

Jeaneth Joy D. Naturales, Mark Philip M. Acebes, Jeremy DC. Cervantes, Francis Adrian R. Colobong, Alvin Morales, Sydbert D. Paltingca, James Ed L. Pepito, Angel Grace C. Sarmiento, Christian Dave B. Sy

St. Clare College of Caloocan, Bachelor of Science in Computer Science

DOI: https://doi.org/10.51584/IJRIAS.2026.11060055

Received: 25 May 2026; Accepted: 30 May 2026; Published: 22 June 2026

ABSTRACT

The physical storage of hardbound theses presents significant limitations in accessibility, search efficiency, and long-term preservation. This study developed ThesisVault, a web-based smart repository system designed to preserve and improve access to academic research for the Bachelor of Science in Computer Science program at St. Clare College of Caloocan.

The system incorporates digital preservation, full-text search and filtering, metadata management, role-based access control (Guest, Student, Moderator, Superadmin), and advanced features including a Plagiarism Checker, Related Studies search, and a bilingual English-Tagalog AI Chatbot. Using a quantitative research approach and Agile methodology, pre-development surveys were administered to 300 students and 6 faculty members to identify challenges and feature preferences, followed by post-development evaluation with hands-on testing.

Results showed that students faced significant difficulties with manual searches (WM=3.94) and topic verification (WM=3.88), while faculty cited the lack of a centralized database (WM=4.33) and inefficient retrieval processes (WM=4.33) as primary concerns. Post-development evaluation revealed substantial improvements, with students rating the system at 4.83 (Very Useful) and faculty at 4.65 (Very Useful), up from pre-development ratings of 4.28 and 4.30 respectively. ThesisVault successfully bridges the gap between valuable thesis knowledge and the community's ability to access and utilize that knowledge.

Keywords: digital repository, thesis management, academic archiving, plagiarism detection, AI chatbot, knowledge sharing

INTRODUCTION & LITERATURE REVIEW

Thesis documents serve as records of research, discoveries, and innovations. Within the Bachelor of Science in Computer Science (BSCS) curriculum, a thesis is a mandatory culminating requirement designed to integrate competencies acquired throughout the program.

However, hardbound theses stored in computer laboratories present significant limitations. They are prone to damage, misplacement, and limited accessibility, making it difficult for students and faculty to efficiently locate and utilize research materials. ThesisVault aims to fill these gaps by creating a smart repository system that allows users to upload, search, update, and access thesis works efficiently.

The central problem is how to create a complementary digital solution that enhances access and utility. The study was guided by three key questions:

1. What challenges are encountered in the current thesis archiving and access process?
2. What is the perceived effectiveness of ThesisVault in addressing these challenges?
3. How can findings be utilized for implementation and enhancement?

Digital repository systems have been widely adopted internationally and locally. Loan and Shah (2020) highlighted challenges in metadata and content management for global ETD repositories. Uzwyshyn (2020) provided a blueprint for integrating open-source platforms like DSpace.

Herrera and Gaona (2023) documented DSpace deployment at a Peruvian university, offering practical implementation lessons. França, Araújo, and Silva (2020) described DSpace's support for Dublin Core metadata and role-based access.

Recent studies have further emphasized the importance of digital preservation strategies. Müller and Schmidt (2021) developed a preservation roadmap aligned with the OAIS reference model, providing technical guidance for ensuring repository content longevity. Similarly, Tsolakidis et al. (2023) presented a framework for managing institutional research archives using semantic-web techniques, demonstrating how well-designed repository infrastructure significantly improves organization and accessibility.

In the Philippine context, Mariano (2025) developed an e-document management system for graduate records, emphasizing systematic archiving workflows. Cofino, Enquilino, and Salao (2022) developed the "R2S" repository platform that successfully prevented duplicate titles and improved searchability.

Tindoc et al. (2023) designed the "ASSET" system, improving undergraduate research organization and access. Ronquillo et al. (2023) developed a web-based repository for City College of Tagaytay, demonstrating improved access and reduced duplication.

Related studies provide empirical insights. Perante et al. (2024) and Dela Cruz and Santos (2021) developed web-based thesis archiving systems using PHP, MySQL, and Bootstrap, reporting high user satisfaction and significant time reductions. Gonzales et al.

(2022) integrated plagiarism detection, leading to a 78% reduction in topic duplication. Chen and Liu (2022) developed recommendation systems for repositories, while Nakamura and Tanaka (2023) implemented AI-powered summarization.

The synthesis of literature confirms that digital repositories are a fundamental necessity for modern academic institutions. The challenges of physical document susceptibility, time-consuming manual retrieval, and lack of centralized databases are recurring themes. ThesisVault fills the niche of offering a smart repository with integrated analytical tools and conversational AI assistance tailored for a specific BSCS program.

METHODOLOGY

This study employed a Practical Research approach focused on developing the ThesisVault software solution. A Quantitative research method was utilized, with structured survey questionnaires as the primary data collection tools.

Research Design

The research design was development-oriented, following an Agile Methodology framework. This allowed for incremental development and continuous incorporation of user feedback.

The design process systematically encompassed: (1) identifying system requirements through an initial survey, (2) designing and developing the system in functional modules, and (3) evaluating the final prototype.

System Development and Testing Procedures

The ThesisVault system was developed using the MERN Stack — MongoDB for database management, Express.js for backend framework, React for frontend interface, and Node.js for server-side runtime. Development followed a sprint-based Agile approach consisting of four two-week sprints.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue VI June 2026

Table 1. Testing Methods Employed

Test Type	Description	Participants
Unit Testing	Each module (login, search, upload, etc.) tested individually	Researchers
Integration Testing	Interaction between modules verified	Researchers
User Acceptance Testing (UAT)	Hands-on testing with real users	10 students, 2 faculty members
Usability Testing	Ease of use and navigation evaluated	Same UAT participants

Participants and Sampling

Target respondents were 1,197 BSCS students and faculty members. Slovin's Formula with a 5% margin of error [$n = N / (1 + Ne^2)$] determined a minimum sample of 300 student respondents.

The sample was proportionally distributed across year levels as follows: 1st Year (12.7%), 2nd Year (17.0%), 3rd Year (35.0%), and 4th Year (35.3%). Purposive sampling was used to select six faculty members involved in the thesis process (advisers, panel members, and professors).

Research Instruments

Two sets of structured survey questionnaires were developed and validated by the research adviser. The pre-development instruments gathered baseline data on existing challenges and desired features using 5-point Likert scales (5 = Strongly Agree/Very Useful to 1 = Strongly Disagree/Not Useful).

A post-development feedback survey with identical feature indicators was administered after hands-on testing with a purposively selected subset of respondents.

Data Gathering Procedure

Data gathering occurred in three phases:

- **Phase 1: Pre-Development Survey** – Questionnaires were distributed via Google Forms for remote access and through paper-based administration on campus. A total of 300 student responses and 6 faculty responses were collected.
- **Phase 2: System Development** – Based on requirements identified in Phase 1, ThesisVault was developed using Agile methodology with continuous internal testing.
- **Phase 3: Post-Development Evaluation** – Ten students and two faculty members performed hands-on testing, completing guided tasks (account creation, thesis search, document upload). The post-development feedback survey was then administered.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue VI June 2026

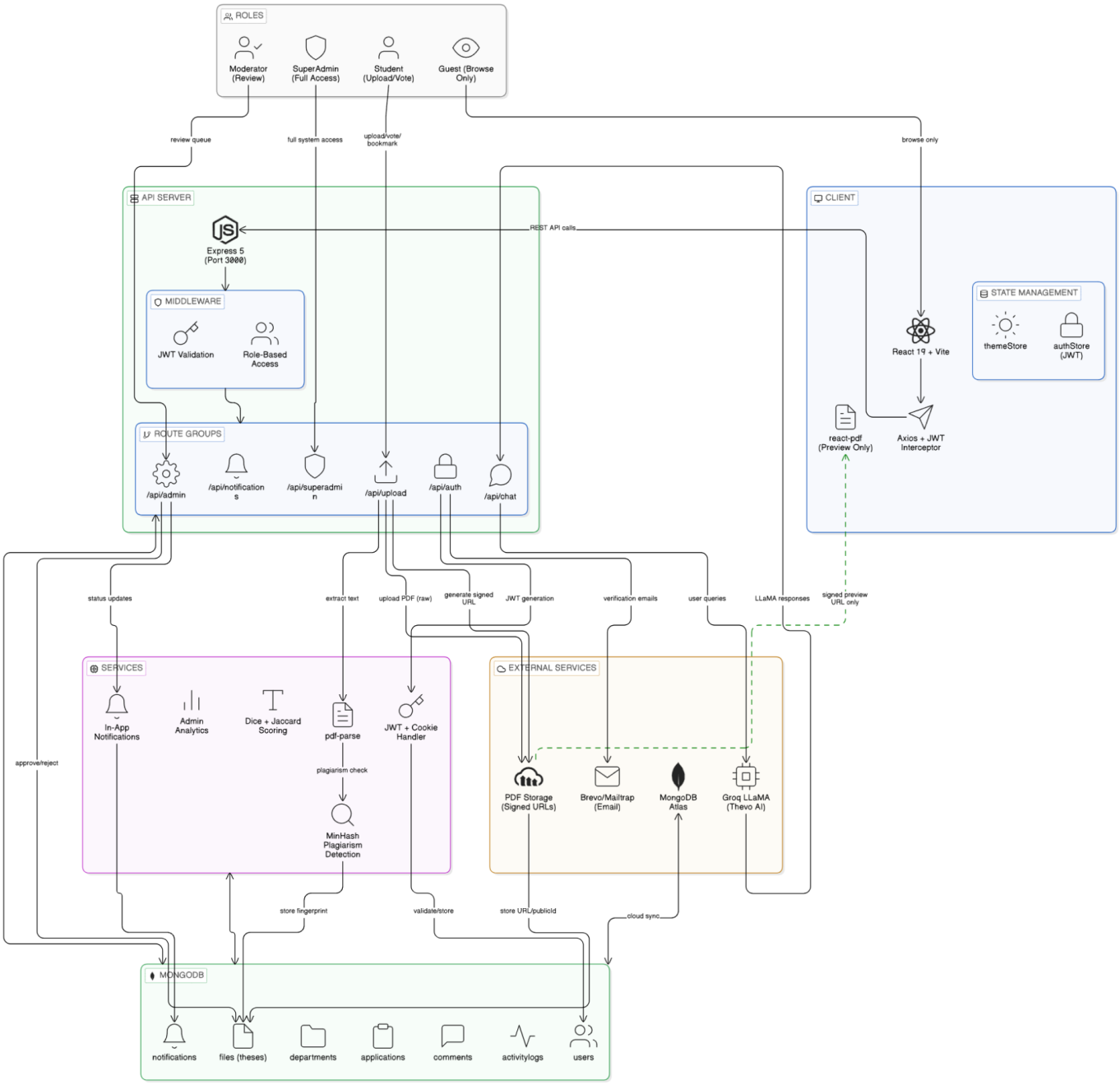

Figure 1. System Architecture

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue VI June 2026

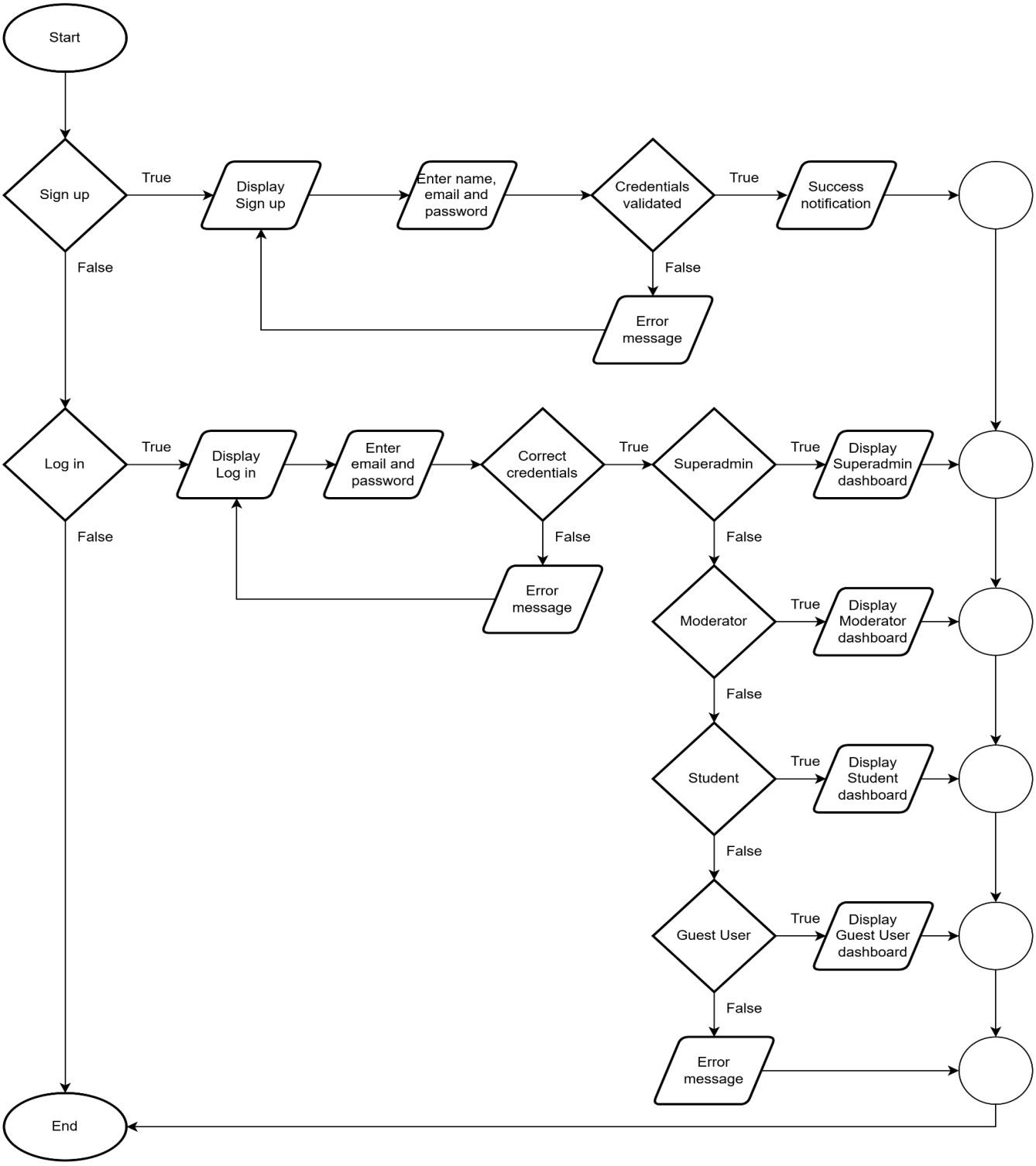

Figure 2. Program Flowchart – Login Process

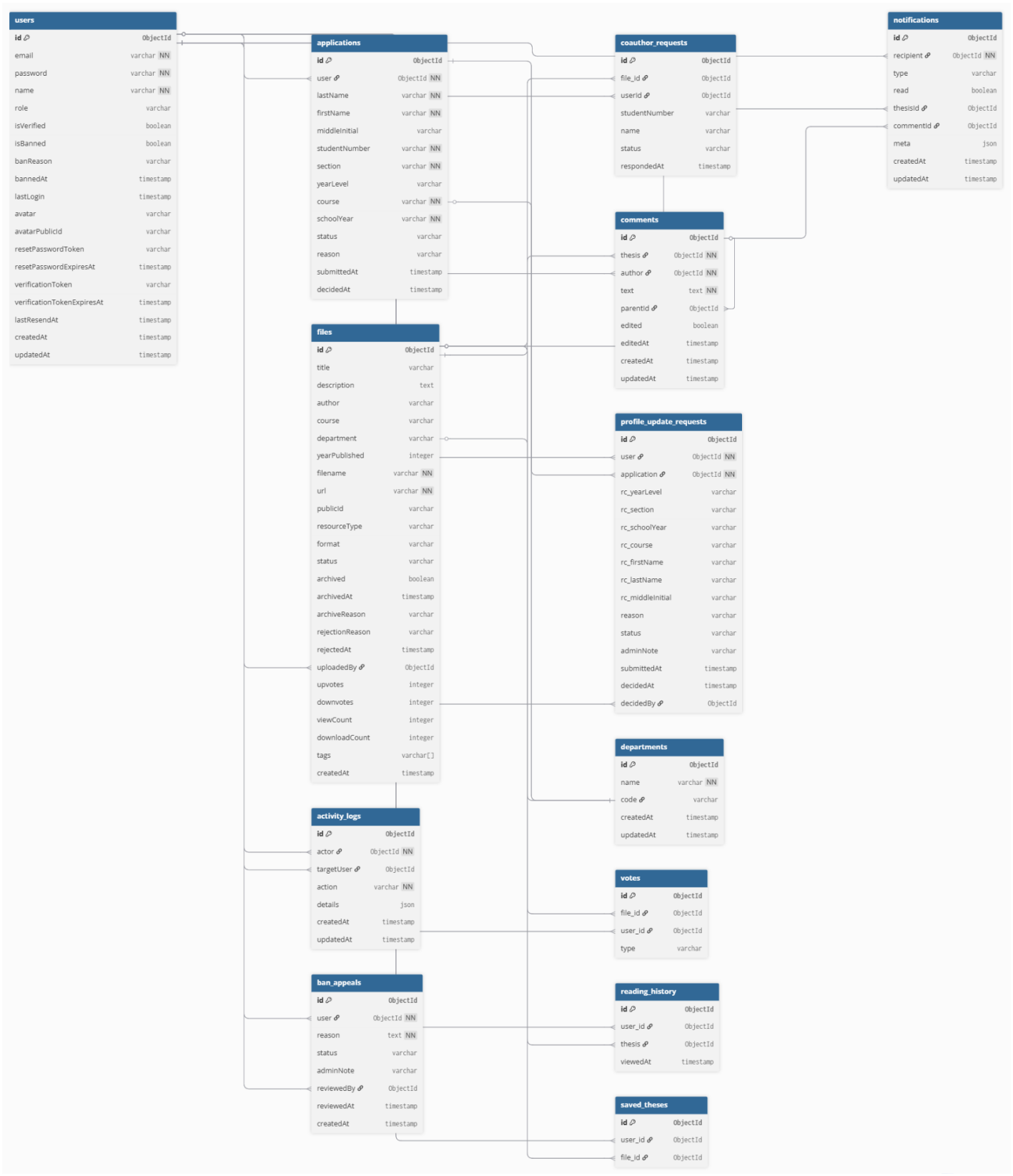

Figure 3. Entity-Relationship Diagram (ERD)

Statistical Treatment

Data were analyzed using:

- **Frequency and Percentage** – For demographic profiles
- **Weighted Mean** – For Likert-scale responses, interpreted using the scale below:

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue VI June 2026

Table 2. Interpretation Scale for Weighted Mean

Range	Interpretation
4.50 – 5.00	Very Useful / Very High
3.50 – 4.49	Useful / High
2.50 – 3.49	Neutral / Moderate
1.50 – 2.49	Slightly Useful / Low
1.00 – 1.49	Not Useful / Very Low

RESULTS AND DISCUSSION

A total of 300 BSCS students participated in the pre-development survey. The majority were aged 21-24 years (62.3%), male (67.0%), and in their third (35.0%) or fourth (35.3%) year. Six faculty members participated, with most serving as BSCS professors (83.3%).

Table 3. Demographic Profile of Student Respondents (Pre-Development)

Category	Frequency	Percentage
Age		
17–20 years old	102	34.0%
21–24 years old	187	62.3%
25–28 years old	9	3.0%
29 years old and above	2	0.7%
Total	**300**	**100%**
Gender		
Male	201	67.0%
Female	91	30.3%
Prefer not to say	8	2.7%
Total	**300**	**100%**
Year Level		
1st Year	38	12.7%

2nd Year	51	17.0%
3rd Year	105	35.0%
4th Year	106	35.3%
Total	**300**	**100%**

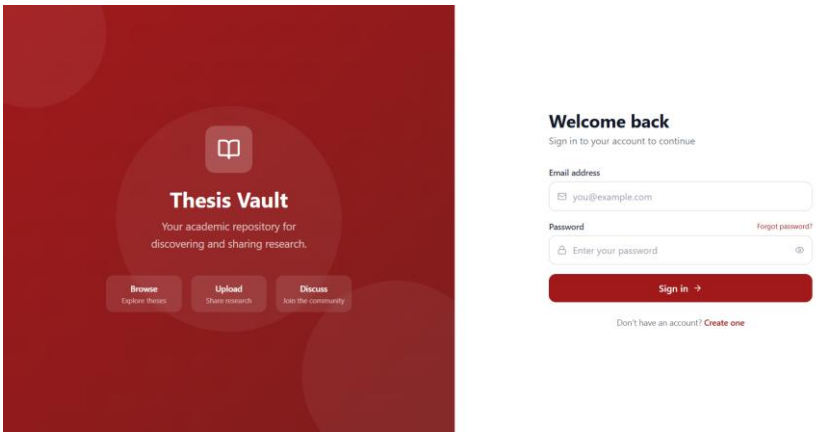

Figure 4. ThesisVault Landing Page

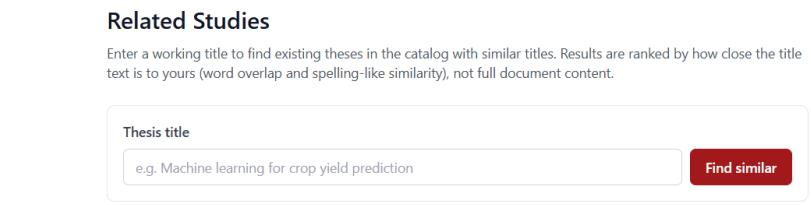

Figure 5. Related Studies Search

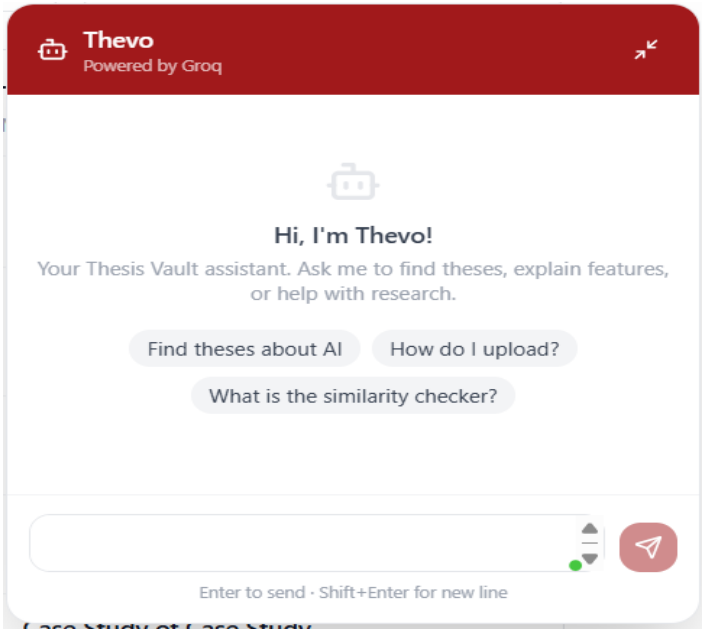

Figure 6. AI Chatbot Window

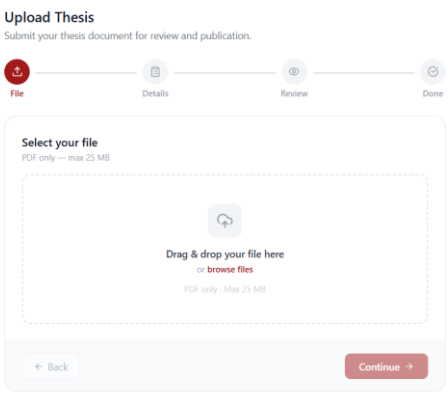

Figure 7. Thesis Upload Page

Challenges in Current System

Students reported significant challenges (overall WM=3.68). The highest-rated indicator was "Finding theses by specific authors or years takes too much effort" (WM=4.00), followed by manual search time (WM=3.94) and topic verification difficulty (WM=3.88). Faculty challenges yielded an overall WM of 4.17, with four indicators tied at 4.33: lack of centralized database, manual retrieval requirements, limited teaching accessibility, and restricted collaboration opportunities.

Pre-Development Feature Evaluation

Students rated all proposed features as Useful (overall WM=4.28), with "Online access to approved thesis documents" highest (WM=4.40). Faculty rated features at 4.30, with "Faculty dashboard" (WM=4.67), "Advanced search" (WM=4.50), and "Quick topic verification" (WM=4.50) as highest.

Post-Development Evaluation

After hands-on testing with 10 students and 2 faculty members, student ratings increased to 4.83 (Very Useful), with "Remote access" achieving a perfect 5.00. Faculty ratings increased to 4.65 (Very Useful), with three features achieving perfect 5.00 ratings: "Faculty dashboard," "Advanced search," and "Quick topic verification."

Table 4. Top-Rated ThesisVault Features (Post-Development)

Rank	Feature	Respondent	WM
1	Remote access from any location with internet	Students	5.00
1	Faculty dashboard for thesis management	Faculty	5.00
1	Advanced search and filter capabilities	Faculty	5.00
1	Quick topic verification against existing works	Faculty	5.00
2	Online access to approved thesis documents	Students	4.90

Comparative Analysis with Existing Systems

Compared to existing repository systems like R2S (Cofino et al., 2022) and ASSET (Tindoc et al., 2023), ThesisVault offers unique features including integrated plagiarism detection, AI chatbot assistance, and bilingual

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue VI June 2026

(English-Tagalog) support. While existing systems focus primarily on archiving, ThesisVault actively assists users in topic verification and research navigation.

These findings align with existing literature. The inefficiencies identified mirror those reported by Cofino et al. (2022) and Perante et al. (2024). The successful integration of plagiarism detection supports Gonzales et al. (2022), who demonstrated reduction in topic duplication. The positive reception of the bilingual AI Chatbot aligns with Patel and Singh (2023) regarding multilingual support importance.

An interesting contrast emerged: Students valued features removing physical barriers (remote access, online viewing), while faculty prioritized oversight and decision-making tools (dashboard, verification). This highlights the importance of role-based design in academic systems.

CONCLUSION

The existing manual storage of hardbound theses at St. Clare College of Caloocan is inefficient and inadequate for modern research needs. The lack of a centralized digital database, time-consuming manual retrieval processes, and limited off-campus accessibility create significant barriers to effective research and collaboration. Students reported considerable time spent on manual searches and difficulty verifying topic originality, while faculty identified the absence of a centralized database and inefficient retrieval as primary concerns.

ThesisVault successfully provides a complementary digital solution that preserves academic research while enhancing accessibility, searchability, and usability. The system's role-based access control ensures appropriate usage while maintaining document security through watermarking and highlight restriction features. Post-development evaluation demonstrated significant improvement in user perception, with student ratings increasing from 4.28 to 4.83 and faculty ratings from 4.30 to 4.65.

Table 5. Summary of Pre-Development and Post-Development Evaluation

Respondent Group	Pre-Development WM	Post-Development WM	Interpretation
Students	4.28	4.83	Very Useful (Very High)
Faculty	4.30	4.65	Very Useful (Very High)

The integration of advanced features—Plagiarism Checker, Related Studies search, and bilingual AI Chatbot—adds significant value by addressing topic originality verification and user navigation concerns. These features distinguish ThesisVault from basic file storage systems and align with contemporary trends in academic repository technology.

RECOMMENDATIONS

The institution should formally adopt ThesisVault as the official digital repository for BSCS thesis submissions, provide infrastructure support, conduct user training, and integrate submission requirements into official thesis guidelines. Future enhancements should include expansion to other programs, integration with external plagiarism databases, voice-activated search, mobile application development, and analytics dashboards. Students and faculty are encouraged to actively utilize the system, particularly the Related Studies feature for topic verification. Future researchers should conduct longitudinal studies on long-term impact and explore additional AI feature integration.

REFERENCES

1. Anderson, L., & Brown, S. (2019). Impact assessment of open access thesis repository at University of Edinburgh. Unpublished research report, University of Edinburgh.
2. Chen, X., & Liu, Y. (2022). Machine learning-based recommendation system for academic repositories at Tsinghua University. Unpublished master's thesis, Tsinghua University.
3. Cofino, C., Enquilino, J., & Salao, J. (2022). R2S: A repository platform for research offices in higher education institutions (HEIs) in the Philippines. CAHE Journal, 11(1). https://d1wqtxts1xzle7.cloudfront.net/85797748/CAHE_111_JJ22_2_Chester_Cofino-libre.pdf?1652177638
4. Dela Cruz, M. A., & Santos, J. P. (2021). Development of a web-based research repository system for Polytechnic University of the Philippines. Unpublished undergraduate thesis, Polytechnic University of the Philippines.
5. França, F. P., de Araújo, D. O., & da Silva, M. B. (2020). A ferramenta para repositórios institucionais DSpace. Revista Ibero-Americana de Ciência da Informação. https://doi.org/10.26512/RICI.V13.N2.2020.31160
6. Gonzales, R. M., Villanueva, E. S., & Cruz, L. T. (2022). Cloud-based research repository with plagiarism detection for Batangas State University. Unpublished undergraduate thesis, Batangas State University.
7. Herrera, M. J. T., & Gaona, J. W. T. (2023). Instalación e Implementación de DSpace como Repositorio Institucional de Documentos Científicos en la Universidad Nacional de Jaén. Pakamuros. https://doi.org/10.37787/wwxeq441
8. Loan, F. A., & Shah, U. Y. (2020). Global electronic thesis and dissertation repositories – collection diversity and management issues. Insights: The UKSG Journal. https://doi.org/10.1629/UKSG.524
9. Mariano, Jr., A. (2025). Recoletos de Bacolod Graduate School Docuware: E-Document Management System. Technium Social Sciences Journal, 71(1). https://doi.org/10.47577/tssj.v71i1.12740
10. Müller, T., & Schmidt, A. (2021). Long-term preservation strategies for electronic theses and dissertations at Technical University of Munich. Unpublished master's thesis, Technical University of Munich.
11. Nakamura, T., & Tanaka, Y. (2023). Artificial intelligence-powered abstract summarization for thesis repository at University of Tokyo. Unpublished master's thesis, University of Tokyo.
12. Patel, R., & Singh, K. (2023). Multilingual search interface for institutional repository at Indian Institute of Technology Delhi. Unpublished master's thesis, Indian Institute of Technology Delhi.
13. Perante, W. J. A., Barnaba Jr., E. O., Cañete, J. R., & Niegas, M. E. (2024). Design and develop a thesis and capstone project manuscript archiving management system for Eastern Visayas State University Ormoc Campus. Unpublished undergraduate thesis, Eastern Visayas State University.
14. Ronquillo, R. A. U., Viscaya, M. L. A., Nuestro, M. H., Tuballa, J. H., & Vida, B. B. (2023). Web-based repository of research outputs for City College of Tagaytay. Retrieved from Academia.edu.
15. Tindoc, F. P. Jr., Torres, R. G., Corpuz, K. A. C., Salem, J. T., & Paliuanan, L. P. (2023). Design and development of the ASSET: A web-based research archiving system. Journal of Pure and Applied Sciences, 1(2). https://csu.org.ph/jpas/article/view/32?utm
16. Tsolakidis, A., Triperina, E., Triantafyllou, I., & Skourlas, C. (2023). Developing the infrastructure for managing institutional research archives. Journal of Integrated Information Management, 8(1), 28–35.
17. Uzwyshyn, R. (2020). Developing a digital scholarship ecosystem. Proceedings of the International Conference on Educational and Information Technology. https://doi.org/10.1145/3383923.3383926