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Development of a Tri Dharma Database System for the Culinary Education Study Program

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ABSTRACT

Purpose: This study aimed to develop and evaluate a Tri Dharma-based database system to improve document management and administrative services in the Culinary Education Study Program at State University of Medan. **Methods:** This study employed a Research and Development (R&D) approach using a modified Borg and Gall development model combined with a prototype approach. The study involved 23 participants, consisting of two information system experts, one media expert, and twenty prospective users (lecturers and administrative staff) who participated in the validation and user evaluation processes. Data were collected through observations, interviews, expert validation sheets, and user response questionnaires and analyzed using descriptive statistics. **Findings:** The developed database system obtained a mean feasibility score of 4.00 from the information system experts, 4.40 from the media expert, and 4.33 from users. These findings indicate that the system is feasible, user-friendly, and effective in supporting the management of Tri Dharma activities, improving document organization, and facilitating academic administration at the study program level. **Research Implications:** The database system can be implemented as an administrative management tool to improve document organization, support accreditation activities, and strengthen data management practices within higher education institutions. **Originality:** This study presents an integrated database system specifically designed to manage education, research, community service, and supporting academic activities within a study program, providing a practical model that can be adapted by other higher education institutions.

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INTRODUCTION

Higher education institutions play a strategic role in producing competent graduates, advancing scientific knowledge, and contributing to community development through the implementation of the Tri Dharma of Higher Education, which encompasses education, research, and community service. The successful implementation of these three pillars generates a substantial amount of academic and administrative data that must be systematically organized to support institutional governance, quality assurance, accreditation, and evidence-based decision-making. As universities increasingly adopt digital transformation strategies, effective information management has become an essential component of higher education administration.

The rapid advancement of information and communication technology has significantly influenced the management of academic information within higher education institutions. Educational organizations are required to manage growing volumes of data generated from academic, research, and community engagement activities in an efficient and reliable manner (Folorunso & Akinwale, 2010). Database systems provide an effective solution by enabling structured data storage, retrieval, and management while reducing redundancy and improving data consistency (Connolly & Begg, 2010; Pressman, 2012). Furthermore, well-designed database systems facilitate information accessibility, improve organizational efficiency, and support managerial decision-making through reliable and integrated information resources (Feinberg, 2017; Simon, 2015)

Beyond data management, information systems implemented in higher education must also ensure usability, accessibility, and data security. Information quality and user satisfaction are recognized as fundamental indicators of information system effectiveness (Thong & Yap, 1996; Moody, 2003). Educational databases frequently contain sensitive information related to lecturers, students, research outputs, and institutional performance; therefore,

appropriate security mechanisms and controlled user access are essential to maintain data confidentiality and integrity (D'hooge et al., 2020; Kieseberg et al., 2013). In addition, users' technological competence plays an important role in ensuring that database systems are effectively utilized within educational institutions (Ayoku & Okafor, 2015).

Previous studies have demonstrated that academic information systems contribute significantly to improving administrative efficiency and institutional performance in higher education. (Sa'diah et al., 2021; Yuneti et al., 2020) reported that academic information systems facilitate coordination, monitoring, and reporting processes, while (Triono et al., 2023 ; Al-Emran et al., 2018)found that integrated information systems improve the quality of academic services and organizational performance. Yunita et al., (2022); Abdullah et al.,(2016) emphasized the importance of integrated higher education data ecosystems for enhancing institutional effectiveness, whereas (Stojanov & Daniel, 2024); Dick et al., 2015) highlighted the increasing role of reliable data infrastructures and analytics in supporting evidence-based decision-making within universities.

Although previous studies have established the importance of academic information systems and integrated educational databases, most of them focus on university-wide information management or institutional digital ecosystems. Limited attention has been given to database systems specifically designed to accommodate the operational needs of individual study programs, particularly those integrating education, research, community service, and supporting academic activities within a single platform. Existing studies also provide limited discussion regarding practical database applications that can directly support accreditation, quality assurance, and routine administrative management at the study program level. This limitation represents an important research gap that requires further investigation.

Preliminary observations conducted in the Culinary Education Study Program, State University of Medan, identified several practical challenges in managing academic data. Documents related to education, research, community service, and supporting academic activities were stored separately using different administrative procedures, resulting in fragmented information, inefficient document retrieval, and difficulties during accreditation, internal audits, and institutional reporting. Although the university has implemented centralized information systems, these systems provide limited flexibility for managing study program-specific data. Accordingly, the primary problem addressed in this study is the absence of an integrated database system capable of supporting systematic and efficient management of Tri Dharma activities at the study program level.

The novelty of this study lies in the development of a Tri Dharma-based database system specifically designed for study program administration rather than institutional-level management. Unlike previous studies that primarily focused on university-wide academic information systems, the proposed system integrates education, research, community service, and supporting academic activities into a single offline platform equipped with structured data management, user authentication, and data recapitulation features. This approach provides a practical solution for improving administrative efficiency, strengthening document management, and supporting accreditation and quality assurance activities within higher education study programs.

Based on the identified research gap and practical problems, this study aims to develop and evaluate a Tri Dharma-based database system for the Culinary Education Study Program at State University of Medan. Specifically, the study seeks to (1) develop an integrated database system to support the management of education, research, community service, and supporting academic activities, and (2) evaluate the feasibility and usability of the developed system through expert validation and user testing.

METHOD

This study employed a Research and Development (R&D) approach to develop a database system based on the Tri Dharma of Higher Education for the Culinary Education Study Program at the State University of Medan. The R&D approach was selected because the primary objective of this study was to design, develop, and evaluate a database system that could improve the management of academic documents related to education, research, community service, and supporting academic activities. The development process adopted the Borg and Gall model (Borg & Gall, 1983) combined with a prototype development approach (Pressman, 2012). The original Borg and Gall model consists of ten stages; however, in this study the model was modified into six stages to accommodate the scope and objectives of the research. The dissemination and large-scale implementation stages were not conducted because the research focused on product development and feasibility evaluation within a single study program. The prototype approach was integrated to facilitate continuous interaction between developers and users during system development, enabling revisions based on user feedback before the final implementation.

The research was conducted in the Culinary Education Study Program, Department of Family Welfare Education, State University of Medan, from February to June 2025. The study involved 23 participants, selected purposively according to their expertise and involvement in academic administration. The participants consisted of two information

system experts, who evaluated the technical quality, database structure, and system functionality; one media expert, who assessed interface design, navigation, and usability; and twenty prospective users, comprising lecturers and administrative staff, who participated in the user evaluation of the developed system. These participants were selected because they are directly involved in managing academic documents and implementing Tri Dharma activities within the study program.

The modified Borg and Gall model implemented in this study consisted of six development stages, namely needs analysis, system planning and design, prototype development, expert validation, product revision, and user testing. During the needs analysis stage, observations and semi-structured interviews were conducted with lecturers and administrative staff to identify problems in managing academic data and to determine user requirements for the database system. Based on the findings, the researchers designed the database architecture, user interface, workflow, and system features before developing the prototype using Microsoft Access. The prototype included modules for lecturer profiles, education and teaching, research activities, community service activities, supporting academic activities, and data recapitulation. Subsequently, the prototype was validated by the information system experts and media expert. Suggestions obtained during the validation process were used to revise and improve the system before it was implemented in the user testing stage. The final evaluation involved twenty lecturers and administrative staff who assessed the system in terms of system usage, suitability to user needs, data management, data accessibility, and expected output quality to determine its practicality and usability.

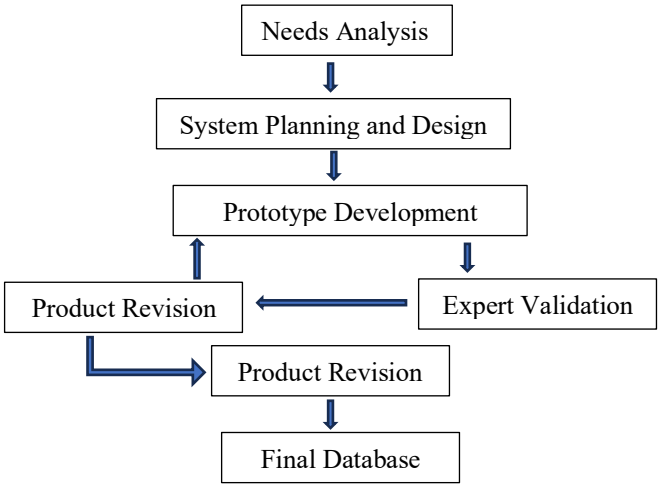

Figure 1. Reseacrh Procedure Based on The Modified Borg and Gall Development Model

Data were collected using observation sheets, interview guidelines, expert validation sheets, and user response questionnaires. Observations and interviews were conducted during the preliminary stage to identify existing administrative procedures and challenges in managing Tri Dharma documents. The expert validation sheets were employed to evaluate the technical quality, functionality, interface design, and overall feasibility of the database system. Meanwhile, the user response questionnaire was administered during the implementation stage to measure users' perceptions regarding the practicality, usability, and effectiveness of the developed system in supporting academic administration at the study program level.

Qualitative data obtained from observations and interviews were analyzed descriptively to identify user needs and determine system development priorities. Quantitative data obtained from expert validation and user response questionnaires were analyzed using descriptive statistics by calculating the mean score for each assessment aspect using the following formula:

$$X = \frac{\Sigma\chi}{\mathcal{N}}$$

X = mean score
$\Sigma\chi$ = total score obtained
N = number of raters

The interpretation of the mean scores was based on the five-point Likert scale presented in Table 1.

Tabel 1. Interpretation of Mean Scores

Mean Score	Category
4.21–5.00	Excellent
3.41–4.20	Good
2.61–3.40	Fair
1.81–2.60	Poor
1.00–1.80	Very Poor

A database system was considered feasible for implementation if the overall mean score fell within the Good or Excellent category

RESULTS

The preliminary study was conducted through observations and semi-structured interviews with lecturers and administrative staff of the Culinary Education Study Program, State University of Medan. The observations indicated that academic documents related to education, research, community service, and supporting academic activities were stored in separate files and locations. As a result, data retrieval often required considerable time, particularly during accreditation preparation, internal audits, and institutional reporting activities.

The interview results revealed that lecturers and administrative staff frequently encountered difficulties in locating supporting documents because information was recorded using different formats and procedures. Several participants reported that data duplication, incomplete documentation, and the absence of a centralized storage system reduced administrative efficiency. Participants also emphasized the need for an integrated database system that could facilitate document storage, updating, retrieval, and reporting through a single platform.

These findings indicate that although the university had implemented a centralized information system, access to specific academic records at the study program level remained limited. Consequently, educational activities, research outputs, community service programs, and supporting academic documents were often managed separately, making data organization and retrieval less effective. The qualitative findings obtained from observations and interviews served as the basis for identifying user requirements and determining the functional specifications of the database system.

The needs analysis further identified several essential system requirements, including lecturer profile management, integrated documentation of Tri Dharma activities, controlled user access, data recapitulation features, and efficient reporting functions. Based on these requirements, a database system was designed to integrate various academic records into a single platform tailored to the operational needs of the study program.

Table 2. Summary of Needs Analysis Findings

Data Collection Technique	Main Findings
Observation	Academic documents related to education, research, community service, and supporting academic activities were stored separately, making retrieval and reporting inefficient.
Interview	Lecturers and administrative staff required an integrated database system to simplify document storage, updating, retrieval, and reporting processes.
Document Review	Existing academic records showed inconsistencies in organization and duplication of information across administrative documents.

Based on the needs analysis findings presented in Table 2, the functional requirements of the database system were formulated and subsequently implemented during the development stage.

Database System Development

Based on the results of the needs analysis, a database system was developed using Microsoft Access as the primary platform. The system was designed to support the management of academic data related to the implementation of the Tri Dharma of Higher Education. The developed database consists of several main components, including lecturer profiles, educational and teaching activities, research activities, community service activities, supporting academic activities, and data recap features. The login interface was developed to provide controlled access to the system through username and password authentication. After successful authentication, users are directed to the main dashboard, which provides access to all database functions.

Figure 1. Login Interface and Home Page

The lecturer profile module was developed to record personal and professional information of lecturers. This module serves as the primary database containing lecturer identity information and professional achievements that can be used for academic administration and reporting purposes.

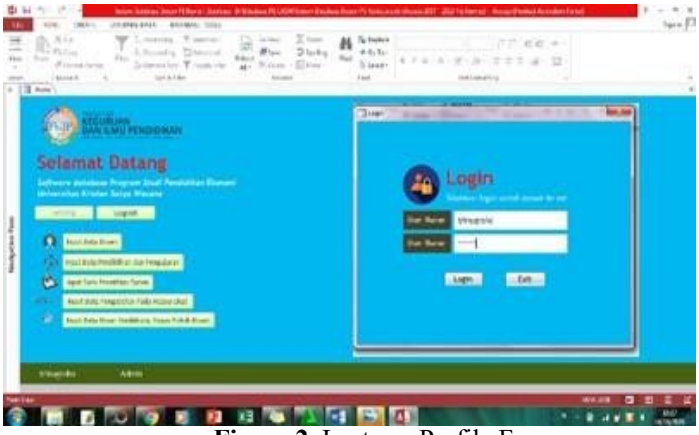

Figure 2. Lecturer Profile Form

The education and teaching module allows users to document educational activities carried out by lecturers, including teaching assignments, academic supervision, curriculum development, and professional competency improvement activities. All submitted information is automatically stored and organized within the database system.

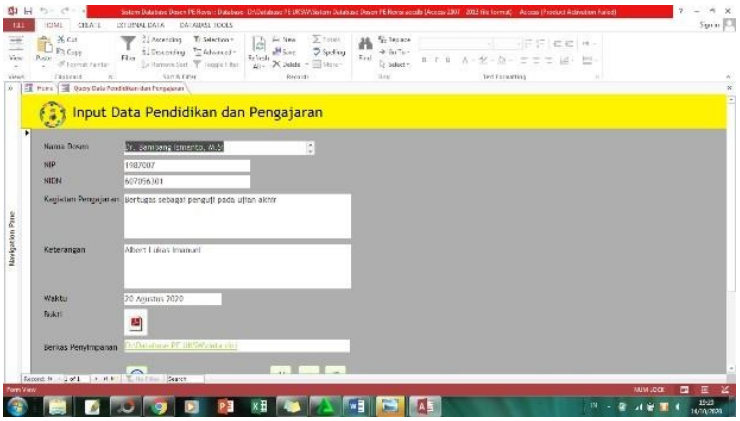

Figure 3. Education and Teaching Data Form

The research module was designed to record research-related activities conducted by lecturers. This module accommodates information regarding research projects, scientific publications, intellectual property rights, and other scholarly outputs produced by academic staff.

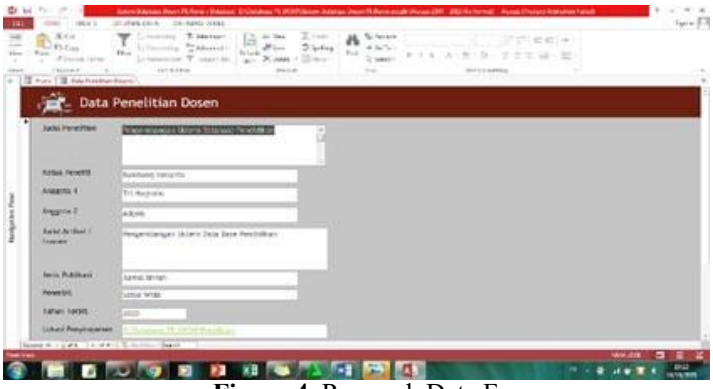

Figure 4. Research Data Form

The community service module facilitates the documentation of community engagement activities conducted by lecturers. Information related to community service programs, training activities, and social empowerment initiatives can be systematically recorded and archived within the system.

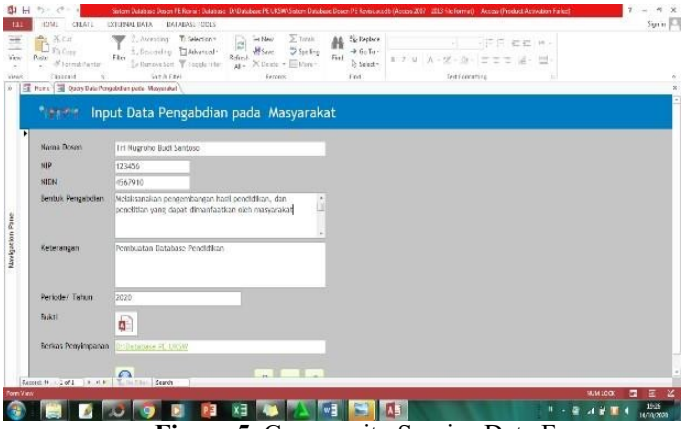

Figure 5. Community Service Data Form

In addition to the three main pillars of the Tri Dharma of Higher Education, the system also provides a module for recording supporting academic activities. This module is intended to document professional contributions such as committee memberships, organizational involvement, awards, and other supporting activities relevant to lecturer performance assessment.

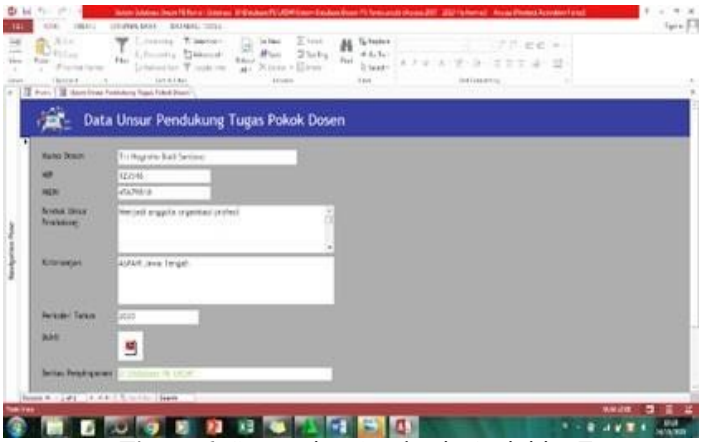

Figure 6. Supporting Academic Activities Form

To facilitate reporting and administrative processes, the database system includes a data recapitulation feature. This feature enables users to retrieve, summarize, and export data into various formats for institutional reporting, accreditation, and audit purposes.

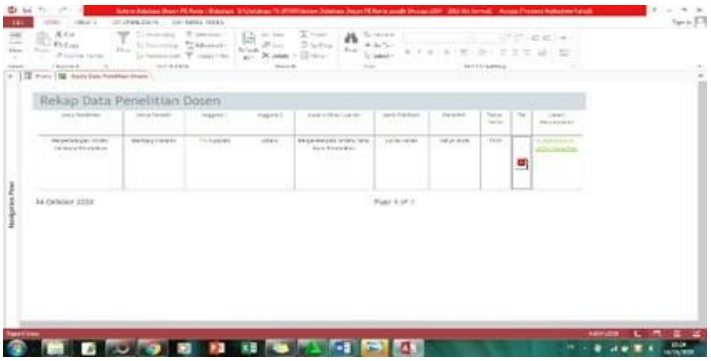

Figure 7. Data Recapitulation Interface

Feasibility Testing Results

The developed database system was evaluated through expert validation and user testing to determine its feasibility and effectiveness for implementation. The evaluation involved information system experts, media experts, and prospective users of the system. The results of the information system expert evaluation showed an average score of 4.00, indicating that the developed database system met the required standards in terms of functionality, structure, and technical performance. The media expert evaluation resulted in an average score of 4.40, demonstrating that the system possessed a user-friendly interface, appropriate visual design, and satisfactory usability. Furthermore, user evaluation produced an overall average score of 4.33, indicating that the system was considered practical and useful for managing academic data at the study program level. The detailed results of the feasibility assessment are presented in Table 3.

Table 3. Feasibility Assessment Results of the Developed Database System

Evaluator	Mean Score	Category
Information System Expert	4.00	Good
Media Expert	4.40	Excellent
Users	4.33	Excellent

The user evaluation was further conducted involving 20 prospective users, consisting of lecturers and administrative staff, to assess specific aspects of system utilization, including system usage, suitability to user needs, data management, data accessibility, and expected output quality. The evaluation aimed to determine the practicality and usability of the developed database system in supporting academic administration at the study program level. The results are presented in Table 4.

Table 4. User Evaluation Results

Assessment Aspect	Mean Score
System Usage	4.33
Suitability to User Needs	4.67
Data Management	4.00
Data Accessibility	4.33
Expected Output	4.33
Overall Average	4.33

Overall, the feasibility testing results indicate that the developed database system is suitable for implementation in supporting the management of Tri Dharma of Higher Education activities within the Culinary Education Study Program. The positive responses from experts and users demonstrate that the system successfully addresses the identified needs for integrated academic data management.

DISCUSSION

The findings of this study demonstrate that the developed database system is feasible and effective for supporting the management of the Tri Dharma of Higher Education activities at the study program level. The positive evaluations provided by information system experts, media experts, and prospective users indicate that the system fulfills the

essential requirements of functionality, usability, accessibility, and administrative effectiveness. These findings suggest that the developed database successfully addresses the operational challenges identified during the preliminary needs analysis by providing an integrated platform for managing educational, research, community service, and supporting academic activities. Rather than functioning solely as a data storage application, the system facilitates more systematic document organization and improves the accessibility of academic information required for daily administrative tasks.

One of the primary problems identified before system development was the fragmentation of academic data. Educational activities, research outputs, community service records, and supporting documents were stored separately, making document retrieval inefficient during accreditation, internal audits, and institutional reporting. The developed database system offers an alternative solution by integrating these academic records into a single platform that can be managed directly by the study program. This integration not only improves document organization but also minimizes information fragmentation that frequently delays administrative processes. These findings support the study of (Yunita et al., 2022), who emphasized the importance of integrated higher education data ecosystems in improving data consistency, accessibility, and institutional performance.

The user evaluation results further indicate that the developed system successfully accommodated the operational needs of lecturers and administrative staff. The highest evaluation was obtained for the suitability to user needs, demonstrating that the database features reflected actual administrative workflows within the study program. This finding highlights the importance of conducting a comprehensive needs analysis before developing educational information systems. The combination of the modified Borg and Gall model with the prototype approach enabled continuous interaction between developers and prospective users, allowing revisions to be made throughout the development process. Consequently, the resulting system was not only technically feasible but also highly acceptable to its intended users because it was developed based on real administrative requirements rather than solely on technical considerations. This finding is consistent with (Pressman, 2012), who emphasized that iterative user involvement contributes significantly to the usability and acceptance of software products.

From the perspective of educational management, the developed database system contributes to improving administrative efficiency and information management within the study program. Academic activities related to teaching, research, and community service generate substantial documentation that must be managed continuously. Without an integrated management system, institutions often encounter difficulties in preparing accreditation documents, monitoring lecturer performance, and compiling institutional reports. The data recapitulation feature incorporated into the developed system enables users to retrieve and summarize information more efficiently, thereby reducing document duplication and shortening the time required for reporting processes. These findings are consistent with (Joyce & Calhoun, 2024), who reported that academic information systems improve coordination and administrative effectiveness in higher education. However, unlike previous studies that primarily focused on university-wide information systems, the present study demonstrates that similar benefits can also be achieved through a database specifically designed to support study program administration. This difference represents an important contribution because study programs often require more flexible and context-specific data management than that provided by centralized institutional systems.

The findings also demonstrate the growing importance of data-driven management in higher education. Reliable academic databases support evidence-based decision-making by providing accurate and well-organized information for quality assurance, strategic planning, and institutional evaluation. Bond et al., (2021) argued that higher education institutions increasingly require reliable digital infrastructures to support academic governance. Although the developed database operates as an offline system, it provides a structured mechanism for organizing academic information that supports managerial decision-making at the study program level. Therefore, the system contributes not only to administrative efficiency but also to strengthening institutional governance through better information management.

Another important aspect identified in this study is the protection of academic data. During the preliminary needs analysis, lecturers and administrative staff expressed concerns regarding data confidentiality and unauthorized access. To address these concerns, the database was developed with user authentication through a login mechanism and controlled access to database functions. Although the current implementation is intended for offline use within the study program, these security features provide an initial safeguard for protecting academic information. This finding supports the view of (Jones et al., 2020), who emphasized that educational institutions should implement appropriate security mechanisms to ensure responsible management of institutional data.

The development process adopted in this study also demonstrates the effectiveness of integrating the Borg and Gall development model with the prototype approach in educational technology development. Continuous feedback obtained from experts and prospective users enabled iterative improvements before the final implementation. This

collaborative development process ensured that technical quality and user requirements received equal attention throughout system development, resulting in a database system that is both feasible and practical for educational administration.

The novelty of this study lies in the development of a database system specifically designed to manage the implementation of the Tri Dharma of Higher Education at the study program level. Previous studies generally emphasized institutional academic information systems or university-wide database management. In contrast, the developed system integrates educational, research, community service, and supporting academic activities into a single platform tailored to the operational needs of a study program. This approach provides greater flexibility for managing academic documentation while complementing existing institutional information systems.

From a practical perspective, the developed database system offers several benefits for higher education institutions. It can support accreditation preparation, lecturer performance evaluation, quality assurance activities, and institutional reporting through more organized and accessible academic documentation. Furthermore, the integrated data recapitulation feature reduces the administrative burden associated with manual document management and facilitates faster retrieval of information required for managerial decision-making. Consequently, the developed system has the potential to be adapted for implementation in other study programs with similar administrative characteristics.

Despite these encouraging findings, this study has several limitations. First, the database system was developed and evaluated only within the Culinary Education Study Program at the State University of Medan, which may limit the generalizability of the findings to other higher education institutions. Second, the evaluation focused primarily on system feasibility and user perceptions without examining its long-term impact on administrative performance or organizational effectiveness. Finally, the system was developed using Microsoft Access, which is suitable for study program administration but may require migration to web-based or cloud-based platforms to support broader institutional implementation. Therefore, future research is recommended to evaluate the developed system in different institutional contexts and integrate more advanced technologies to improve scalability, accessibility, and long-term system performance.

Overall, the findings indicate that the developed database system provides an effective solution for managing the implementation of the Tri Dharma of Higher Education at the study program level. The positive evaluations from experts and users, together with the integrated management features, demonstrate the system's potential to improve academic administration, support quality assurance, and strengthen evidence-based governance in higher education institutions.

CONCLUSION

This study successfully developed a database system to support the management of the Tri Dharma of Higher Education activities within the Culinary Education Study Program at the State University of Medan. Developed using the modified Borg and Gall model integrated with a prototype approach, the system demonstrated good feasibility and usability based on evaluations conducted by information system experts, a media expert, and prospective users. The integrated database effectively supports the organization, storage, and retrieval of academic information related to education, research, community service, and supporting academic activities, thereby improving administrative efficiency and facilitating accreditation, quality assurance, and institutional reporting.

Theoretically, this study contributes to the field of educational information systems by demonstrating that the integration of educational development models with iterative software development approaches can produce database systems that are both technically feasible and responsive to the operational needs of higher education study programs. Practically, the developed database provides a flexible and integrated solution for improving academic data management while supporting evidence-based institutional governance at the study program level.

Despite these encouraging findings, this study was limited to implementation within a single study program and focused primarily on evaluating system feasibility and user acceptance. Future research is therefore recommended to examine the long-term effectiveness of the system across multiple higher education institutions and to integrate web-based or cloud-based technologies to improve scalability, accessibility, and interoperability.

REFERENCE

Abdullah, F., Ward, R., & Ahmed, E. (2016). Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios. *Computers in Human Behavior*, *63*, 75–90. https://doi.org/10.1016/J.CHB.2016.05.014

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology Acceptance Model in M-learning context: A systematic review. *Computers & Education*, *125*, 389–412. https://doi.org/10.1016/J.COMPEDU.2018.06.008

Ayoku, A. O., & Okafor, V. N. (2015). ICT skills acquisition and competencies of librarians in Nigerian university libraries. *Library Philosophy and Practice*, 1–20.

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency remote teaching in higher education: mapping the first global online semester. *International Journal of Educational Technology in Higher Education 2021 18:1*, *18*(1), 50. https://doi.org/10.1186/S41239-021-00282-X

Borg, W. R., & Gall, M. D. (1983). *Educational research: An introduction (4th ed.)*. Longman.

Connolly, T. M. ., & Begg, C. E. . (2010). *Database Systems: A Practical Approach to Design, Implementation, and Management (6th ed.).* Pearson

D'hooge, L., Wauters, T., Volckaert, B., & De Turck, F. (2020). Inter-dataset generalization strength of supervised machine learning methods for intrusion detection. *Journal of Information Security and Applications*, *54*, 102564. https://doi.org/10.1016/J.JISA.2020.102564

Dick, W., Carey, L., & Carey, J. O. (2015). *The Systematic Design of Instruction* (8th ed.). Pearson.

Feinberg, M. (2017). Reading databases: slow information interactions beyond the retrieval paradigm. *Journal of Documentation*, *73*(2), 336–356. https://doi.org/10.1108/JD-03-2016-0030

Folorunso, O., & Akinwale, A. T. (2010). Conceptual logic for educational data mining. *Nternational Journal of Computer Science and Network Security*, *10*(9), 113–120.

Jones, K. M. L., Asher, A., Goben, A., Perry, M. R., Salo, D., Briney, K. A., & Robertshaw, M. B. (2020). "We're being tracked at all times": Student perspectives of their privacy in relation to learning analytics in higher education. *Journal of the Association for Information Science and Technology*, *71*(9), 1044–1059. https://doi.org/10.1002/asi.24358

Joyce, B., & Calhoun, E. (2024). *Models of teaching*. Routledge.

Kieseberg, P., Leithner, M., Mulazzani, M., Huber, M., Schrittwieser, S., Weippl, E., & Holzinger, A. (2013). Protecting anonymity in data-driven systems. *International Journal of Pervasive Computing and Communications*, *9*(4), 321–338.

Moody, D. (2003). The method evaluation model: A theoretical model for validating information systems design methods. In *ECIS*.

Pressman, R. S. (2012). *Software engineering: A practitioner's approach (7th ed.)*. McGraw-Hill.

Sa'diah, H., Sulaiman, & Rizali, A. M. (2021). Management of Academic Information System in Higher Education. *Journal of K6 Education and Management*, *4*(2), 151–161. https://doi.org/10.11594/JK6EM.04.02.04

Simon, P. (2015). *Too Big to Ignore: The Business Case for Big Data*. John Wiley & Sons, Inc.

Stojanov, A., & Daniel, B. K. (2024). A decade of research into the application of big data and analytics in higher education: A systematic review of the literature. *Education and Information Technologies*, *29*(5), 5807–5831. https://doi.org/10.1007/S10639-023-12033-8

Thong, J. Y. L., & Yap, C. S. (1996). Information systems effectiveness: A user satisfaction approach. *Information & Management*, *30*(5), 247–259.

Triono, W., Lesmi, K., & Khotimah, I. (2023). Optimization and Challenges of Implementing Academic Service Management Information Systems in Muhammadiyah Higher Education: A Multiple-Case Study. *Jurnal Pendidikan Islam*, *12*(2), 155–162. https://doi.org/10.14421/JPI.2023.122.155-162

Yuneti, Y., Musril, H. A., & Sundari, R. (2020). Pengembangan Database Kinerja Dosen Berbasis Android. *Jurnal Inovasi Teknologi Pendidikan*, *7*(1), 89–98.

Yunita, A., Santoso, H. B., & Hasibuan, Z. A. (2022). 'Everything is data': towards one big data ecosystem using multiple sources of data on higher education in Indonesia. *Journal of Big Data 2022 9:1*, *9*(1), 91. https://doi.org/10.1186/S40537-022-00639-7

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