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The Management of Database Administration for Accreditation of Study Programs in Islamic State Universities

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ABSTRACT

This study aims to analyze the data management processes in State Islamic Higher Education Institutions (PTKIN) to enhance their academic quality and accreditation achievements. Using a qualitative approach with case studies at several PTKINs, the research focuses on identifying challenges and proposing solutions for optimizing database management. Data collection methods include documentation, observations, and in-depth interviews with key stakeholders. The findings reveal that database management is critical for supporting accreditation and institutional development. Challenges such as insufficient human resources, system inefficiencies, and weak coordination among administrative units hinder optimal data management. However, solutions include strengthening technological infrastructure, enhancing human resource capabilities through training, and implementing integrated management information systems. Moreover, innovative technologies like artificial intelligence, big data analytics, and blockchain are recommended to improve data accuracy, security, and usability. The research concludes that effective data management significantly impacts PTKIN accreditation and reputation. Institutions need to prioritize the development of systems, policies, and resources to achieve their vision as leading educational institutions contributing to society.

Keyword : Database Management, PTKIN Accreditation, Academic Information Systems

1. INTRODUCTION

The management of databases in higher education institutions has become a fundamental element in realizing good institutional governance, including in the context of Islamic State Universities (PTKIN) in Indonesia. Databases serve as the central repository of strategic information, covering academic data, human resources, and institutional performance achievements. The integration and reliability of such data are crucial factors supporting the accreditation process, which, in turn, determines the reputation and public trust in higher education institutions.

In higher education, accreditation is a formal mechanism used to assess the quality of educational delivery by independent bodies such as the National Accreditation Agency for Higher Education (BAN-PT). One of the key indicators in this process is the integrity and accuracy of the data submitted by the institution. Current accreditation instruments, such as the Accreditation Instrument for Higher Education (IAPT)

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3.0 and the Conversion Supplementary Instrument (ISK), require universities to provide verified and well-documented data. The success in meeting these demands heavily depends on the quality of the institution's database management (Dewi et al., 2022; Briney, 2015).

At PTKIN, data management faces unique challenges due to the complexity of systems and the diversity of administrative units that must be integrated. Data collection, validation, and reporting often become burdensome tasks, especially since many PTKIN still use fragmented information systems. This issue is compounded by the limited human resources with expertise in information technology-based data management. As a result, many universities struggle to present accurate and relevant data to support the accreditation process (Susanti & Pratama, 2021).

A study by Hakim (2020) found that unstructured data management is often a primary cause of institutional failure to achieve excellent accreditation status. The research showed that institutions using integrated database systems tend to perform better in accreditation processes. This is due to the system's ability to produce consistent reports that meet the standards set by BAN-PT. Implementing information technology supporting integrated data management can also improve operational efficiency and minimize data errors (Hakim, 2020).

Other literature highlights the importance of technology-based data management in supporting an institution's strategic policies. Briney (2015) emphasized that effective data management should include systematic planning, organizing, storage, and archiving processes. Additionally, data management must be equipped with auditing and control mechanisms to ensure its integrity and security. The adoption of modern technologies such as cloud computing, big data analytics, and integrated information systems can help universities enhance their data management quality (Briney, 2015; Dewi et al., 2022).

Improving database management at PTKIN is also relevant in the context of national policies related to the Higher Education Database (PDDikti). As the primary platform used by the government to monitor university performance, PDDikti requires universities to regularly upload complete, accurate, and up-to-date data. However, research by Susanti and Pratama (2021) indicates that many PTKIN still face challenges in meeting PDDikti's standards, particularly concerning data validity and consistency. This highlights the need for greater investment in technological infrastructure development and human resource training within PTKIN.

The importance of good data management is also reflected in the success stories of several PTKIN in achieving excellent accreditation. For example, Sunan Gunung Djati State Islamic University (UIN Bandung) became one of the top universities in Indonesia in the Webometrics ranking. This success is largely supported by the implementation of an integrated information system and professional data management (Pendis Kemenag, 2024). This experience demonstrates that investment in data management not only improves accreditation quality but also strengthens the institution's reputation at both national and international levels.

The book Higher Education Management in the Digital Era by Wahyudi (2021) underscores that data management in universities should be approached holistically and strategically. Wahyudi (2021) notes that effective data governance requires not only advanced technology but also the institution’s commitment to building a culture of data-driven decision-making. This culture enables institutions to use data as a foundation for making strategic decisions,

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including in accreditation planning and program development.

By examining the various challenges and opportunities, this study aims to explore database management at PTKIN as a determining factor in achieving accreditation. This research will not only identify weaknesses in the existing data management system but also propose strategies to improve the efficiency and effectiveness of data management within PTKIN. It is hoped that the findings of this study will make a tangible contribution to enhancing the quality of higher education in Indonesia, particularly in PTKIN.

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2. LITERATURE REVIEW

This study is grounded in several relevant theories to understand and analyze database management in State Islamic Higher Education Institutions (PTKIN). These theories not only clarify the fundamental concepts of data management but also provide a framework for evaluating challenges and solutions in the context of higher education accreditation.

Management Information Systems Theory

The theory of management information systems emphasizes the importance of integrated data management to support effective decision-making within organizations. Laudon and Laudon (2021), in their book Management Information Systems: Managing the Digital Firm, explain that management information systems encompass software, hardware, and procedures designed to meet organizational information needs. In the PTKIN context, this theory is relevant for understanding how information systems such as EMIS (Education Management Information System) and PDDikti (Higher Education Database) serve as strategic tools to support accreditation processes.

This theory also highlights the need for reliable technological infrastructure, user training, and data governance policies. Laudon and Laudon (2021) underscore that organizations with integrated information systems tend to adapt more effectively to external environmental changes, including meeting accreditation requirements.

Total Quality Management (TQM) Theory

Total Quality Management (TQM) is a systematic approach to improving organizational quality through continuous improvement. According to Goetsch and Davis (2016) in Quality Management for Organizational Excellence, the main principles of TQM include the involvement of all stakeholders, data-driven management, and customer orientation. In the context of database management, TQM provides a framework for evaluating the consistency and quality of data collection, validation, and reporting processes.

This approach is relevant for PTKIN to ensure that the data presented for accreditation is not only accurate but also useful for analysis and strategic planning. Goetsch and Davis (2016) emphasize that the success of TQM in data management relies on the organization's commitment to fostering a culture of quality at all levels.

Knowledge Management Theory

Knowledge management focuses on how organizations create, share, and utilize knowledge to achieve strategic goals. Nonaka and Takeuchi (1995), in their book The Knowledge-Creating Company, explain that both explicit knowledge, such as documented data, and tacit knowledge, such as individual experience, must be managed holistically to create a competitive advantage.

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In this study, knowledge management theory is relevant for explaining how database management at PTKIN can leverage the collective knowledge of accreditation teams and data managers. Nonaka and Takeuchi (1995) also highlight the importance of knowledge-sharing mechanisms between units, which can help prevent data fragmentation and ensure that all stakeholders have access to the necessary information for supporting accreditation.

Data Governance Theory

Data governance provides a framework for managing organizational data assets, focusing on quality, security, and regulatory compliance. Khatri and Brown (2010), in their article Designing Data Governance published in Communications of the ACM, explain that effective data governance involves clear roles and responsibilities, supportive policies, and tools for monitoring and auditing data.

This theory is highly relevant to this research, given the importance of data governance at PTKIN to ensure that the data used in accreditation processes meets national and international standards. Khatri and Brown (2010) also emphasize that successful data governance depends on the integration of technology, processes, and people.

Diffusion of Innovation Theory

Diffusion of innovation explains how new technologies are adopted within a social system. Rogers (2003), in his book Diffusion of Innovations, describes that technology adoption is influenced by the characteristics of the innovation itself, such as ease of use and compatibility with existing systems, as well as organizational factors, including leadership support and human resource readiness.

In the PTKIN context, this theory helps explain the challenges faced in implementing modern and integrated database systems. Rogers (2003) also highlights the importance of communication and training in accelerating the adoption of new technologies, which is relevant to supporting technology-based data management.

Theoretical Framework of the Research

This study integrates the aforementioned theories to build a comprehensive theoretical framework for analyzing database management at PTKIN. Management information systems theory provides a foundation for understanding the role of technology in supporting data management, while TQM and data governance theories offer guidance for evaluating data quality and reliability. Knowledge management theory explains the importance of collaboration and information sharing between units, and diffusion of innovation theory provides insights into the adoption of new technologies in the PTKIN context.

By synthesizing these theories, this study aims to provide an in-depth understanding of how database management can be improved to support the achievement of superior accreditation outcomes.

3. METHODS

This study employs a qualitative descriptive approach aimed at providing an in-depth understanding of database management in State Islamic Higher Education Institutions (PTKIN). The primary focus is to explore how data management processes are carried out by data management units and accreditation teams across various PTKINs in Indonesia, as well as to identify the challenges and solutions encountered in their implementation.

Using this approach, the research not only emphasizes data collection but also analyzes how data management

supports the accreditation process of study programs within PTKINs. Data were collected through in-depth interviews, direct observations, and document analysis. The research subjects included database administrators, accreditation teams, and institutional leaders from several universities representing diverse regions in Indonesia. The institutions selected for this study include IAIN Syekh Nurjati Cirebon, UIN Walisongo Semarang, IAIN Pekalongan, IAIN Purwokerto, UIN Sultan Maulana Hasanudin Banten, and UIN Syarif Hidayatullah Jakarta. These institutions were chosen based on their varied institutional characteristics and their experience in managing databases to support accreditation.

In-depth interviews were conducted with data administrators and accreditation teams to gather insights into their experiences using data management systems. Direct observations were carried out at each institution to understand the implementation of database systems in daily practices and to verify information obtained from the interviews. Additionally, document analysis was conducted to review policies, procedures, and technical guidelines applied by the universities regarding data management and accreditation processes.

By adopting this approach, the study aims to provide a comprehensive overview of the state of data management in PTKINs, as well as to identify the challenges faced and the solutions implemented to address issues in data management related to accreditation.

4. RESULT AND DISCUSSION

The Database Management Process in State Islamic Higher Education Institutions (PTKIN)

The database management process in State Islamic Higher Education Institutions (PTKIN) plays a vital role in ensuring that academic information systems and related data are efficiently and effectively managed to support educational activities, administrative functions, and quality enhancement across the institutions. Each PTKIN has designated units responsible for designing, managing, and integrating information systems for various internal and external purposes.

An example of effective database management is demonstrated by UIN Sultan Maulana Hasanuddin Banten. At this university, the database management is conducted by the Center for Technology and Database (Pustekipad), which plays a central role in ensuring that the university's information systems, such as the Academic Information System (SIAKAD), function optimally. Pustekipad holds significant responsibility for ensuring proper data management and synchronizing with national digital systems implemented by the government, such as Forlap Ristekdikti. This data management is crucial since the data reported by the university impacts various aspects, including program and institutional accreditation. Moreover, Pustekipad regularly updates and enhances the existing data systems to adapt to technological advancements and institutional needs. Collaboration between Pustekipad and various faculties and study programs at UIN Sultan Maulana Hasanuddin Banten is key to ensuring that the collected and managed data aligns with academic, administrative, and accreditation assessment needs. Faculty and study program data managers play a critical role in ensuring that essential data, ranging from student records and class schedules to other tri-dharma (three pillars of higher education) activities, are accurately recorded in the SIAKAD system.

Similarly, at IAIN Syekh Nurjati Cirebon, database management is a crucial aspect supporting academic

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performance and institutional development. The unit responsible for database management at IAIN Syekh Nurjati Cirebon is the Information Technology and Database Unit (PTIPD), tasked with ensuring the smooth operation of information systems and driving innovation. PTIPD focuses on integrating various information systems used by the university, such as the Academic Information System (Siakad), E-SMS, and Forlap Ristekdikti. These systems facilitate reporting processes and ensure that managed data is accurate and meets established standards. Additionally, PTIPD oversees and evaluates data produced by each study program. The integrated system enables faculties and study programs to use data more efficiently, which supports planning, decision-making, and reporting required to meet accreditation standards.

The database management process at IAIN Syekh Nurjati Cirebon relies heavily on solid collaboration between the central unit, PTIPD, and data managers at the study program level. Study program data managers are responsible for inputting data related to student activities and faculty tri-dharma tasks. They also ensure that program information, such as curricula and statutes, is continuously updated and synchronized with university-level data. This integration enables PTIPD to verify and validate data efficiently. Furthermore, PTIPD supports study programs in accreditation processes by ensuring all required data, including reports to Forlap Ristekdikti, are prepared and submitted on time. Given that accreditation outcomes depend heavily on data quality and completeness, PTIPD ensures that study programs at IAIN Syekh Nurjati Cirebon achieve favorable accreditation results.

UIN Walisongo Semarang also exemplifies effective database management. At this university, academic and administrative data management is handled by the Center for Technology, Information, and Database (PTIPD), which ensures the seamless operation of integrated data systems, such as SIAKAD and SiJamu (University Quality Assurance System), to meet institutional needs. PTIPD at UIN Walisongo has successfully developed a self-sustained integration system without relying on external service providers, allowing the university to fully control data management and development while innovating to meet evolving needs. PTIPD collaborates with study program data managers to ensure the accurate recording of data, including student information, class schedules, and tri-dharma activities, in compliance with applicable regulations.

At the study program level, data managers are tasked with inputting data on student academic activities and reporting faculty tri-dharma activities. The central PTIPD unit manages and updates information on program statutes, curricula, and other educational management data. This data management is especially critical during accreditation, where PTIPD ensures that all reported data meets quality standards. A key aspect of accreditation is the submission of data to Forlap Ristekdikti, which is reviewed by BAN-PT assessors as part of program quality evaluations. PTIPD ensures that study programs at UIN Walisongo Semarang can report data accurately and punctually to achieve optimal accreditation results.

In summary, database management at PTKIN institutions, such as UIN Sultan Maulana Hasanuddin Banten, IAIN Syekh Nurjati Cirebon, and UIN Walisongo Semarang, highlights the importance of well-integrated and effectively managed information systems to support academic and administrative success. Success in data management depends not only on appropriate technology usage but also on strong collaboration between central units, such as Pustekipad and PTIPD, and faculty and study program data managers. Effective database management also plays

a critical role in supporting study program accreditation, as accurate and timely data significantly contribute to optimal accreditation results. Additionally, proper data management helps higher education institutions make strategic decisions, plan institutional development, and enhance the quality of education provided to students.

Challenges in Managing Databases at Islamic State Higher Education Institutions (PTKIN)

The management of databases at Islamic State Higher Education Institutions (PTKIN), such as UIN Sultan Maulana Hasanuddin Banten, IAIN Syekh Nurjati Cirebon, and UIN Walisongo Semarang, faces a number of complex technical challenges. One of the primary issues is the alignment and integration of data across various systems within each institution. At UIN Sultan Maulana Hasanuddin Banten, despite the use of SIAKAD developed by Gamatechno, delays in data updates frequently occur. These delays can result in discrepancies between field data and the reports prepared for evaluation and accreditation purposes. Such misalignment significantly affects the accuracy of reporting, particularly when the institution undergoes accreditation assessments that heavily rely on the quality and timeliness of data management.

Similarly, IAIN Syekh Nurjati Cirebon encounters challenges in data integration among the various systems employed. Although the institution has adopted integrated systems such as the Academic Information System (Siakad) and the Ristekdikti Forlap, the primary challenge lies in synchronizing data across units, from study programs to central units. Each study program manages its own information systems and databases, which may not always align with the systems used by the central PTIPD unit. Inconsistent data formats or system updates not uniformly implemented across units can compromise the system's effectiveness in producing accurate reports. These synchronization issues have a direct impact on the timeliness and accuracy of accreditation-related data reporting.

At UIN Walisongo Semarang, while the institution has successfully created a well-integrated system, continuous updates are necessary to keep up with changes in policies or emerging institutional needs. For instance, the existing information systems must adapt to shifts in accreditation standards set by BAN-PT or Ristekdikti. This underscores that database management involves not only technical aspects but also responsiveness to evolving higher education dynamics. Without timely system updates, reporting processes—crucial for evaluating education quality—can be hindered.

Another significant challenge is the diversity of data that PTKIN must manage and report. At UIN Sultan Maulana Hasanuddin Banten, for example, accreditation purposes require reporting on various aspects, including student academic records, faculty data, and campus activities and facilities. Each study program has distinct data sets, all of which must be seamlessly integrated into a unified system accessible by the entire institution. Problems arise when these data are stored across multiple systems that do not share compatible formats or lack interoperability. In some instances, data updated at the faculty or study program level is not reflected in the central system, requiring additional efforts from central data managers to ensure accurate records. These discrepancies pose a significant challenge for database management, particularly in preparing accreditation reports that demand consistency and data accuracy.

At IAIN Syekh Nurjati Cirebon, despite the implementation of E-SMS by the Quality Assurance Unit (LPM) and the

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integration of Siakad by PTIPD, significant challenges remain in coordinating between units. Study programs scattered across various geographic locations, such as Cirebon and its surrounding areas, require substantial time and effort to maintain data consistency. Data managers at each study program must ensure that their records comply with the standards set by PTIPD at the central level. This often becomes problematic, especially when data needs to be urgently updated for accreditation purposes. Timely data updates are critical but are frequently hampered by technical issues and insufficient coordination, which can disrupt reporting processes and potentially impact accreditation evaluations crucial to the institution's reputation.

The data entry process itself also poses challenges for database management at these three institutions. At UIN Walisongo Semarang, for instance, data managers at study programs are responsible for inputting information related to student and faculty academic activities. Inaccurate or incomplete data during this stage can lead to significant issues when such data is later used for accreditation reports or program evaluations. In many cases, data managers at the program level must ensure that all student records and academic activities are meticulously documented to avoid omissions. This challenge becomes even more pronounced when dealing with various data formats that may not be fully compatible with the existing systems.

Additionally, PTKIN institutions face challenges in effectively utilizing appropriate technology. At UIN Sultan Maulana Hasanuddin Banten, despite employing a system developed by Gamatechno, technical limitations often prevent the system from handling all types of data. System updates or modifications frequently require additional costs and time, hindering optimal data management. Similarly, IAIN Syekh Nurjati Cirebon and UIN Walisongo Semarang must continually innovate to ensure their technology remains relevant to increasingly complex data management needs. While efforts are made to improve and update systems, significant challenges persist in ensuring that the technology used can handle the growing volume of data as student enrollment and study programs increase.

Another issue faced by these institutions is limited funding for developing and maintaining better database management systems. Most PTKIN institutions rely on internal funding, which is often constrained. This financial limitation hampers the efficiency of database management. Although efforts are made to secure financial support from the government or other related organizations, the available funds are frequently insufficient to meet all the technological development needs for improved data management systems. As a result, existing systems tend to stagnate and fail to evolve in line with institutional requirements, rendering data management more prone to errors and discrepancies, ultimately affecting the quality of the reports produced.

Beyond budget constraints, another challenge involves adhering to various regulations and standards set by accreditation bodies. At IAIN Syekh Nurjati Cirebon and UIN Walisongo Semarang, data managers must continuously stay updated on reporting requirements for Ristekdikti Forlap and other accreditation agencies. Changes in regulations or reporting standards can impact the existing systems, requiring program-level data managers to ensure that their records comply with the latest guidelines. Delays or inaccuracies in reporting this data can affect accreditation outcomes, potentially harming the institution's reputation and its ability to secure government funding.

Finally, database management at PTKIN institutions must contend with

challenges related to training and developing the human resources responsible for operating these systems. While technical issues are prominent, the role of data managers at both the program and central unit levels is crucial to ensuring the system functions effectively. Thus, effective data management must be supported by continuous capacity-building efforts for system operators. Without adequate training, data managers may fail to fully utilize the system's potential, exacerbating the challenges of data management and compromising the quality of the reports generated.

In conclusion, the challenges of managing databases at PTKIN institutions range from technical issues concerning system integration and updates to resource and funding limitations. Nevertheless, institutions such as UIN Sultan Maulana Hasanuddin Banten, IAIN Syekh Nurjati Cirebon, and UIN Walisongo Semarang are striving to enhance their database management systems through necessary updates and developments. Successfully addressing these challenges will depend on how swiftly and effectively these institutions adapt to technological changes and the extent of support they receive in terms of funding and human resource development.

Solutions for Enhancing Database Management to Support Program Accreditation in PTKIN

Improving database management is a crucial factor in enhancing the accreditation of study programs within State Islamic Higher Education Institutions (PTKIN). Strengthening information technology (IT) infrastructure serves as a significant initial step. The implementation of cloud computing ensures more secure data storage and better accessibility, facilitating the management of academic information necessary for the accreditation process. Additionally, the application of big data analytics enables in-depth analysis of academic data, providing valuable insights for improving educational quality. The integration of blockchain technology can further enhance data security and transparency, ensuring the integrity of information used in accreditation assessments.

Developing human resource (HR) competencies in data management is also essential. Regular training and certification for data management staff ensure they have the required skills to operate complex management information systems. The establishment of specialized teams skilled in data analysis can aid in the preparation of accurate and relevant reports for accreditation purposes. Moreover, providing incentives to staff who excel in data management can boost their motivation and performance, ultimately contributing positively to the quality of the data presented.

Optimizing processes and Standard Operating Procedures (SOP) in data management represents the next step. Streamlining workflows and automating data collection and processing can improve efficiency and reduce human error. Implementing an integrated management information system enables data synchronization across departments, ensuring consistency and accuracy of information presented in accreditation documents. Regular internal audits of data and its management processes are also crucial to ensure compliance with established standards.

The use of Artificial Intelligence (AI)-based technology can drive innovation in database management. AI can automatically detect anomalies in data, helping to maintain the quality and integrity of information. Furthermore, machine learning can be employed to predict trends and patterns in academic data, providing insights for strategic decision-making to improve study program quality. AI-powered

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recommendation systems can also suggest necessary improvements based on historical data analysis.

Enhancing collaboration and system integration across departments and institutions can enrich database management. The implementation of a centralized management information system allows for easier, real-time data access, supporting transparency and information accuracy. Collaboration with other institutions in sharing best practices and resources can improve the efficiency and effectiveness of data management. Developing web- and mobile-based applications can also facilitate data access for stakeholders, increasing responsiveness and flexibility in information management.

A policy- and regulation-based approach to database management ensures that data management processes comply with applicable standards and regulations. Enforcing policies that mandate regular data reporting with clear sanctions can improve discipline and compliance in data management. Harmonizing national-level regulations with PTKIN data management systems ensures alignment and consistency in the accreditation process. Aligning data standards across departments is also important to reduce errors and increase efficiency in information processing.

Improving data quality through the application of data cleansing tools and data governance techniques ensures that the information used in the accreditation process is accurate and relevant. Real-time data quality monitoring allows for early detection of errors or inconsistencies, enabling prompt corrective actions. Moreover, the implementation of strict data quality standards ensures that the information provided meets the requirements and expectations of accreditation bodies. This is crucial for building trust and credibility with stakeholders.

A culture of data-driven decision-making (DDDM) must be cultivated at all levels of institutional management. Strengthening this culture ensures that every decision is based on accurate and relevant data analysis, increasing the objectivity and effectiveness of decisions. Providing intuitive data visualization dashboards can help management quickly comprehend information and make timely decisions. Incentives for study programs that demonstrate high performance in data reporting and utilization can foster healthy competition and overall quality improvement.

Finally, enhancing data security and privacy is an aspect that cannot be overlooked. The implementation of data encryption and cybersecurity protocols based on international standards, such as ISO 27001, ensures that sensitive information is protected from unauthorized access. Training on data security for all staff involved in system management raises awareness and preparedness in addressing security threats. This is vital for maintaining the integrity and trustworthiness of the database management system used

5. CONCLUSION

This study emphasizes that database management at Islamic State Universities (PTKIN) plays a critical role in supporting the accreditation process of study programs. Effective management requires an integrated information system that leverages advanced technologies such as cloud computing, big data analytics, and blockchain. These technologies enable more secure data storage, better accessibility, and improved quality and transparency of data necessary to meet the stringent accreditation standards.The main challenge in database management at PTKIN is the lack of integration across systems in various units and study programs, as well as difficulties in ensuring data consistency and accuracy.

To address this, the solution is the implementation of an integrated management information system, which allows data synchronization across all institutional levels. Improving this system can reduce human error, speed up the data collection and reporting process, and simplify data audit and evaluatio
Additionally, implementing policies that support automation and streamline workflows, as well as utilizing artificial intelligence (AI) technologies to detect anomalies and analyze data, is essential to ensure data quality and integrity. Therefore, enhancing the database management system through the use of cloud-based applications, better integration of information systems across departments, and collaboration with external institutions for data sharing and best practices can serve as a long-term solution. The implementation of strong policies in data management, such as ensuring regular reporting and monitoring of data quality, will further improve the accuracy and effectiveness of the data presented in the accreditation process of study programs.

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