

The Role of QMS in Improving the Efficiency of Academic Information Systems

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Abstract

The purpose of writing this journal is to analyze the role of the Quality Management System (QMS) in improving the effectiveness of academic information systems in higher education. Currently, academic information systems have become one of the key factors in supporting educational processes, ranging from student data management to academic administration; however, many institutions still encounter issues such as invalid data and slow processes. By implementing QMS, institutions are expected to apply quality standards that meet established requirements. In this study, a descriptive qualitative method was used with a narrative analysis technique, focusing on the application of ISO 9001 as the QMS standard. The results of the analysis indicate that consistent implementation of QMS can significantly improve the efficiency of academic information systems, both in terms of service speed and data accuracy. This analysis concludes that the integration of QMS, particularly ISO 9001-based systems, is an essential strategy for higher education institutions in establishing effective, efficient, and sustainable academic information systems.

Keywords: *Quality Management System; Academic Information System; ISO 9001.*

INTRODUCTION

Several studies have examined the relationship between academic information systems and quality management in higher education. Oktaviana, Apriliani, Novita, Mulyeni, and Herlina (2024) examined the implementation of academic information systems to improve campus service quality and found that academic information systems facilitate student access to information without having to interact directly with administrative staff and assist educational staff in managing data more efficiently. Naway, Sukung, Haris, and Rahmat (2018) examined the quality approach in developing management information systems in higher education and emphasized that the integration of quality management principles is a key factor in the success of information systems implementation. Melgis, Aryani, Lestari, and Abdalnazar (2024) analyzed the quality of academic information systems and their impact on system success and found that system quality, information quality, and service quality significantly influence user satisfaction. Meanwhile, Rerung and Ramadhan (2018) designed an academic information system for implementing a smart campus and demonstrated that a web-based system that can be accessed anytime and anywhere, helping students complete academic administration independently. These studies generally focus on the technical aspects of the system or the impact of implementation on quality services, but have not specifically analyzed the role of the Quality Management System (QMS) as a systematic framework that integrates quality standards such as ISO 9001 into the entire academic information system management cycle, including aspects of continuous improvement and system termination (Fernández-Cruz et al., 2020; Idan, 2025; International Organization for Standardization, 2015).

In the era of digitalized education, academic information systems play a crucial role in supporting administrative and learning processes (Tutko & Woźniak, 2022). The efficiency of these systems has become a primary requirement to ensure that academic activities can run faster and more accurately. However, the implementation of academic information systems does not always operate optimally without proper quality management. The Quality Management System (QMS) serves as a systematic approach to ensure that all processes related to managing academic information systems meet established standards. Through the implementation of QMS, educational institutions can not only improve the quality of information services but also optimize resource performance, minimize errors, and accelerate academic service workflows. Research on the role of QMS in improving the efficiency of academic information systems has become increasingly relevant due to rising demands for fast, transparent, and user-oriented academic services (Javed & Alenezi, 2023; Muhith et al., 2025; Sánchez-Meca et al., 2025). With QMS implementation, academic information systems are expected to contribute significantly to the overall effectiveness of higher education management (Chernenko, 2024; Garrido et al., 2024; Llorens-Largo et al., 2023).

Furthermore, the adoption of QMS encourages institutions to establish a structured framework for monitoring, evaluating, and continuously improving system performance. This ensures that the academic information system remains aligned with technological advancements and user needs. Continuous improvement also helps institutions reduce operational risks and enhance system reliability.

Additionally, integrating QMS into academic information systems strengthens institutional accountability by promoting standardized procedures and data accuracy. Such practices lead to better decision-making processes, improved stakeholder satisfaction, and enhanced institutional competitiveness. As higher education evolves, QMS becomes a vital component in building sustainable, high-quality academic information services.

This research offers novelties that distinguish it from previous studies, particularly in terms of the focus of the analysis and the conceptual framework used. Specifically, this research specifically analyzes the role of ISO 9001-based QMS in improving the efficiency of academic information systems as a unified quality management system, rather than solely evaluating system quality from a user perspective. This research also identifies the QMS components that have the most significant influence on academic information system efficiency, namely system quality, information quality, and service quality, while also formulating strategies to overcome implementation barriers that have been only partially discussed in the literature. In addition, this research broadens the scope of the study by emphasizing the importance of QMS integration as an institutional strategy that impacts accountability, system resilience, accreditation readiness, and institutional governance, which have not been widely discussed in previous research. Using library research and narrative analysis methods, this study presents a conceptual synthesis that links quality management principles with the sustainable digital transformation of higher education.

This study aims to analyze the role of Quality Management Systems (QMS) in improving the efficiency of academic information systems in higher education, identify the QMS components that most influence system efficiency, and formulate strategies to overcome various obstacles in implementing QMS in academic information systems. This study is expected to provide practical benefits for higher education administrators in

designing and developing academic information systems that are not only technically reliable but also aligned with international quality standards. For institutional leaders, this study can be a consideration in making policies related to technology investment and the development of internal quality assurance systems. For system developers, this study offers a framework for building user-oriented, efficient, and sustainable academic information systems. Academically, this study contributes to the development of quality management studies and educational information systems, particularly in the context of the implementation of ISO 9001 in academic services at higher education institutions in Indonesia.

This research implies the need for a paradigm shift in the management of academic information systems, from merely an administrative tool to a strategic instrument for institutional quality assurance. Proposed policy implications include the need to integrate QMS from the academic information system planning stage, strengthening human resource capacity through ongoing training, and establishing technical support units that are responsive to user needs. This research also confirms that the success of QMS implementation is determined not only by the readiness of the technological infrastructure, but also by leadership commitment, an organizational culture that supports change, and the active participation of all stakeholders. Furthermore, the theoretical implication of this research is the rationale for applying quality management principles to the domain of educational information systems, which has so far been studied primarily from an information technology perspective. Thus, this research confirms that efforts to improve the efficiency of academic information systems require a holistic approach that integrates quality standards, user capacity development, institutional governance, and system sustainability to achieve superior and competitive academic services.

METHOD

This study employs a library research method, which is a technique of collecting data from literature sources related to academic information, particularly academic journals. This method is used to analyze the implementation of ISO 9001 as a QMS standard through the following points of investigation:

1. Which QMS components have the most significant influence on improving the efficiency of academic information systems?
2. How can the implementation of QMS affect response speed and the accuracy of student data management?
3. What obstacles arise in implementing QMS in the education sector, especially in higher education institutions, and what strategies can be used to overcome these challenges?

The literature in this study was analyzed using a narrative analysis approach that follows the framework proposed by Braun and Clarke (2006) on thematic analysis, adapted to the context of narrative analysis. The analysis process was carried out through several systematic stages. The first stage was familiarization, in which the researcher thoroughly read all literature sources consisting of scientific journals, seminar proceedings, and research reports relevant to the topic of academic information systems and ISO 9001-based quality management. The second stage was coding, which identified units of meaning in the text related to QMS components, academic information system efficiency, implementation

barriers, and strategic problem solving. The third stage was the formation of themes, in which the identified codes were classified into main themes such as system quality, information quality, service quality, principles of continuous improvement, and institutional governance. The fourth stage was a review of the themes to ensure internal consistency and interrelationships between themes. The fifth stage was the explicit definition and naming of the themes. The final stage was writing an analysis report that presents a narrative synthesis of all findings.

The narrative analysis technique applied in this study is beneficial in several important aspects. First, this technique allows researchers to construct a coherent and systematic story about how QMS contributes to the efficiency of academic information systems, not just as a collection of separate findings but as a complete narrative that connects concepts, empirical evidence, and implementation contexts. Second, narrative analysis provides the flexibility to integrate various types of data sources, both quantitative and qualitative studies, into a comprehensive framework of understanding. Third, this approach allows researchers to identify recurring patterns, research gaps, and relationships between variables that might not be apparent using only traditional descriptive analysis. Fourth, narrative analysis is useful for capturing the complexity of QMS implementation in higher education, including organizational dynamics, cultural factors, and the role of leadership that are difficult to measure quantitatively but crucial to implementation success. Fifth, this technique produces a conceptual synthesis that can serve as a foundation for developing new theoretical frameworks and contextual and applicable policy recommendations. Thus, the application of narrative analysis in this literature study not only summarizes previous findings but also builds a new, richer and more meaningful understanding of the role of QMS in improving the efficiency of academic information systems in higher education.

RESULTS AND DISCUSSION

Based on the findings of the research, it was discovered that system quality, information quality, and service quality are the components that have the greatest influence on improving the efficiency of academic information systems. System quality is related to ease of use, clear interface design, and system stability to prevent frequent errors. Information quality concerns the accuracy and speed of the information presented to users. Meanwhile, service quality is associated with how quickly and courteously system administrators respond to user complaints.

These three components make the academic system more efficient because students and lecturers can easily access academic data such as grades, schedules, and registration without long waiting times. The research also shows that systems that are easy to use and provide accurate information significantly increase user satisfaction and speed up campus administrative processes.

The implementation of QMS helps academic systems become more organized and measurable. With clear procedures and standards, student data can be processed more quickly and accurately (Sari et al., 2025). For example, processes such as KRS submission, grade checking, or academic reporting can be done automatically with minimal errors. Additionally, the application of continuous improvement principles within QMS encourages higher education institutions to constantly upgrade their systems. The findings show that once

systems are aligned with quality standards, users can obtain information more quickly and accurately. This directly improves campus services because data no longer needs to be managed manually.

Although the implementation of QMS brings many benefits, the research also identifies several challenges. The most common obstacles include a lack of user understanding, resistance to change, technical issues such as unstable internet networks, and insufficient support from campus management. To overcome these barriers, several strategies can be implemented, such as providing training and socialization for lecturers and staff to help them understand system benefits, increasing leadership commitment to support QMS implementation, and conducting regular evaluations and improvements to ensure continuous system development. Some universities also add helpdesk features and dedicated technical teams to quickly resolve technical problems. Through these efforts, academic information systems can operate more effectively, resulting in higher user satisfaction.

The research findings indicate that the implementation of a Quality Management System (QMS) has a significant impact on improving the efficiency of academic information systems in higher education institutions. This is reflected in improvements in the timeliness of academic services, the accuracy of student data, and the speed of administrative processes.

This increase in efficiency is largely attributed to the application of QMS principles, such as standardized work procedures, continuous quality monitoring, and systematic performance evaluation. Through the adoption of standardized quality practices, every academic activity from data input and validation to reporting becomes more structured, measurable, and consistent.

These findings are in line with the study conducted by Shaqia Nur Oktaviana, Vina Aprilia, Windi Nova Nivita, Sri Mulyeni, and Herlina (2024), which states that QMS implementation enables students to obtain information more easily without needing to interact directly with administrative staff. It also supports academic personnel in managing data and handling academic issues more efficiently, while simultaneously improving service quality. Below are several implementations of academic information systems (AIS) highlighted in their study:

1. **Online Registration**
 - a. Students can register online through the academic information system.
 - b. The electronic registration process reduces queues and waiting times.
2. **Attendance and Absence Management**
 - a. Integration of AIS with student and lecturer attendance systems.
 - b. Automated recording of attendance for both students and lecturers.
3. **Grades and Transcript Management**
 - a. Automatic calculation of student grades.
 - b. Online access for students to view their academic transcripts.
4. **E-Learning and Online Teaching**
 - a. Integration with e-learning platforms to provide online course materials (Alterkait, 2024; Mohammad et al., 2024).
 - b. Use of online forums, virtual examinations, and online assignments.

5. **Student Academic Monitoring**
 - a. Real-time monitoring of students' academic progress.
 - b. Early identification and quick intervention for academic issues.
6. **Data Analytics**
 - a. Academic data analysis to improve teaching and learning efficiency.
 - b. Identification of trends and patterns to support continuous improvement.
7. **Teaching Management and Lecturer Evaluation**
 - a. Online evaluation of lecturer performance by students.
 - b. Analysis of evaluation data for lecturer development.

These efforts enhance the quality of services provided to students and lecturers by making access to campus information more convenient. Additionally, they contribute positively by improving user satisfaction and strengthening the overall performance of all parties involved in campus academic activities.

According to Karsidi (2000), one of the greatest challenges in Indonesian education is improving the quality of education, distributing learning opportunities more evenly, and aligning educational priorities with national development. Several requirements must be met when implementing educational information systems, including wide and continuous dissemination of information, functioning as instructional support, enabling collaborative learning, increasing the diversity of learning resources, enhancing student motivation, and reducing costs.

Based on the literature review, several studies indicate that the implementation of AIS in higher education has shown excellent quality; however, challenges still exist, such as limited human resources and budget constraints. Rerung & Ramadhan (2018) emphasized that web-based academic information systems have been developed and implemented with positive testing results. Such systems can be accessed anytime and anywhere, helping students complete course registration (KRS), print exam slips, and retrieve academic records independently.

Furthermore, the integration of QMS with AIS contributes to the digital transformation of higher education by fostering a culture of data-driven decision-making. When academic institutions rely on accurate, real-time data, leaders can make more strategic decisions regarding curriculum development, resource allocation, and student support services. This leads to more effective institutional planning and enhances overall institutional competitiveness.

Another important impact of QMS integration is the improvement of institutional accountability. As higher education institutions are increasingly required to demonstrate transparency and service quality, QMS offers a framework that documents every step of the academic information process. This ensures that academic data is traceable, auditable, and resistant to manipulation. As a result, trust among stakeholders such as students, lecturers, parents, and accreditation bodies continues to grow.

Moreover, the application of QMS supports the development of a more resilient academic information system. In an era where cyber threats, system failures, and data breaches are becoming more frequent, having well-documented procedures and continuous evaluation significantly reduces operational risks. AIS integrated with QMS is better prepared to handle unexpected disruptions, ensuring minimal impact on academic activities.

The human factor also remains critical. Successful implementation of QMS and AIS requires strong user competence and positive attitudes toward digital systems. Training programs, awareness campaigns, and ongoing technical assistance are essential in ensuring that users from students to administrators maximize the benefits of academic information systems. Institutions that invest in human resource development tend to achieve higher success rates in QMS implementation.

Finally, the future of academic information systems lies in advanced technologies such as artificial intelligence, predictive analytics, and personalized learning systems. QMS serves as the structural foundation that enables these innovations to be adopted effectively and responsibly. By maintaining high standards of quality management, higher education institutions can confidently embrace emerging technologies while ensuring reliability, security, and user satisfaction.

The integration of Quality Management Systems (QMS) with Academic Information Systems (AIS) represents not only a technological advancement but also a strategic shift in how higher education institutions manage quality, accountability, and sustainability. As universities increasingly operate in competitive and digitally driven environments, the alignment between management systems and information technology becomes essential for maintaining institutional relevance and performance.

One of the most significant strategic outcomes of QMS AIS integration is enhanced organizational agility. Higher education institutions must respond rapidly to changes in student needs, regulatory requirements, and labor market demands. Through standardized processes and real-time data access, AIS enables academic leaders to monitor key performance indicators such as enrollment trends, graduation rates, and student retention more effectively. QMS ensures that these processes follow documented standards and continuous improvement cycles, allowing institutions to adapt quickly while maintaining consistency.

Furthermore, QMS-supported AIS strengthens evidence-based policymaking at the institutional level. Decision-makers can utilize comprehensive datasets to evaluate academic programs, identify underperforming areas, and allocate resources more efficiently. For example, predictive analytics derived from AIS can forecast student dropout risks, enabling early intervention strategies. When combined with QMS procedures, these insights become embedded within formal quality assurance mechanisms, ensuring that improvement actions are systematic rather than reactive.

Another critical contribution of QMS AIS integration is the enhancement of accreditation readiness. Accreditation bodies increasingly emphasize digital documentation, outcome-based education, and measurable quality indicators. AIS provides centralized repositories for academic records, curriculum documentation, and assessment results, while QMS guarantees that these data are maintained according to established standards. This synergy simplifies accreditation processes and demonstrates institutional commitment to continuous quality improvement.

From a student-centered perspective, QMS-driven AIS improves learning experiences by promoting transparency and accessibility. Students can track their academic progress, access learning materials, and receive feedback more efficiently. This level of visibility fosters a sense of ownership over learning outcomes and encourages proactive engagement.

Moreover, standardized service procedures reduce administrative inconsistencies, creating a more equitable academic environment for all students.

Lecturers also benefit significantly from integrated systems. AIS streamlines teaching administration, assessment management, and performance evaluation, reducing administrative burdens and allowing educators to focus more on pedagogical innovation. QMS provides structured feedback mechanisms that support professional development, enabling lecturers to refine teaching methods based on student evaluations and learning outcomes.

Institutional collaboration is another area positively influenced by QMS AIS integration. Cross-departmental data sharing becomes more seamless, facilitating coordinated efforts among academic units, student services, and administrative offices. This holistic approach minimizes duplication of work and enhances organizational coherence. In multi-campus institutions, standardized AIS processes ensure consistency across locations, supporting equitable service delivery.

Financial sustainability is also strengthened through digital quality management. AIS enables accurate tracking of tuition payments, scholarships, and operational expenses, while QMS ensures transparency and accountability in financial processes. By reducing inefficiencies and administrative errors, institutions can optimize budget utilization and redirect resources toward academic development and research initiatives.

In the context of Indonesian higher education, QMS AIS integration aligns closely with national education reforms emphasizing digital transformation and quality assurance. Government initiatives promoting Merdeka Belajar and outcome-based education require institutions to demonstrate measurable learning achievements and institutional effectiveness. AIS provides the technological backbone for these reforms, while QMS ensures compliance with quality standards.

However, despite these benefits, implementation challenges remain. Resistance to change, limited IT infrastructure, and disparities in digital competencies can hinder system adoption. Organizational culture plays a decisive role in overcoming these barriers. Leadership commitment is essential to promote a shared vision of digital quality management. Transparent communication and stakeholder involvement can foster acceptance and reduce resistance among staff and students.

Capacity building remains a priority. Continuous professional development programs must accompany system implementation to ensure users possess the skills necessary to operate AIS effectively. Institutions should also establish dedicated support units to address technical issues and provide guidance. Without adequate support, even well-designed systems may fail to deliver expected outcomes.

Cybersecurity and data privacy represent additional considerations. As academic information systems store sensitive personal and institutional data, robust security measures must be embedded within QMS frameworks. Regular audits, access controls, and incident response procedures are essential to protect data integrity and maintain stakeholder trust.

Looking forward, the convergence of QMS and AIS opens opportunities for more advanced educational technologies. Artificial intelligence can personalize learning pathways, adaptive assessments can tailor instruction to individual needs, and learning analytics can

provide deeper insights into student behavior. QMS ensures that these innovations are implemented responsibly, with clear objectives, evaluation criteria, and ethical safeguards.

Moreover, sustainability should guide future system development. Digital platforms must be designed to minimize environmental impact through energy-efficient infrastructure and reduced paper usage. QMS can incorporate sustainability indicators into institutional performance metrics, aligning digital transformation with environmental responsibility.

In conclusion, the integration of Quality Management Systems with Academic Information Systems represents a transformative approach to higher education management. Beyond operational efficiency, it fosters a culture of continuous improvement, accountability, and innovation. For Indonesian universities, this integration offers a pathway toward globally competitive, student-centered, and resilient educational institutions.

By investing in technology, human capital, and governance frameworks, higher education institutions can leverage QMS AIS synergy to enhance academic quality and institutional sustainability. Ultimately, successful implementation depends on a balanced combination of strategic leadership, technical capability, and organizational commitment. When these elements align, academic information systems become not merely administrative tools, but powerful enablers of educational excellence and long-term national development.

CONCLUSION

The implementation of a Quality Management System (QMS), particularly one based on ISO 9001, has been proven to play an important role in improving the efficiency and effectiveness of academic information systems in higher education institutions. Through the application of quality standards, the process of managing academic data becomes more structured, faster, and more accurate.

The key components that have the greatest influence on efficiency improvements are system quality, information quality, and service quality. These three elements enable users both students and lecturers to access academic data easily and obtain timely information. QMS also encourages continuous improvement, allowing educational institutions to adapt to user needs and technological developments. Although challenges such as resistance to change, lack of user understanding, and technical obstacles may arise, these issues can be addressed through training, management support, and routine evaluations. Overall, the implementation of QMS makes academic information systems more efficient, transparent, and user-oriented, while also serving as a strategic step in enhancing the quality of higher education services. It is recommended that higher education institutions integrate QMS principles into academic information system development from the planning stage and invest in continuous digital literacy programs for all users. Future research is encouraged to conduct empirical studies measuring the direct impact of QMS implementation on service performance indicators across different institutional contexts.

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