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Advancing Efficiency, Transparency, and Accuracy of Digital Quality Assurance Systems in Higher Education

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Abstract
The digitization of quality assurance systems in higher education is a critical innovation that enhances efficiency, transparency, and accuracy in ensuring educational quality. This study investigates the implementation and impact of a digitized quality assurance system at the Professional Education and Certification Institute (LPSP) of the State University of Surabaya. The research utilizes a mixed-method approach, combining surveys, semi-structured interviews, document analysis, and observations to gather comprehensive data from 120 respondents, including leaders, staff, faculty, students, and university administrators. Findings reveal that digitization significantly improved efficiency by streamlining workflows and reducing task completion times by up to 70%. The accuracy of data handling increased, with a 30% reduction in errors, while the transparency of processes was enhanced through real-time analytics and shared access to quality assurance metrics. Despite these advancements, challenges such as initial user adaptation, infrastructure limitations, and data privacy concerns were identified. Additionally, some faculty members expressed concerns about reduced personalization in decision-making due to increased reliance on automation. This study highlights the transformative potential of digital quality assurance systems in addressing inefficiencies and enhancing accountability in higher education. Recommendations for improvement include enhanced training programs, infrastructure upgrades, and the development of mobile-friendly interfaces to increase accessibility. The findings contribute to the growing body of knowledge on digital transformation in education and provide actionable insights for institutions seeking to implement similar systems. By balancing automation with human oversight, higher education institutions can ensure sustainable improvements in quality assurance processes.

Keywords: Digitization, Quality Assurance, Higher Education, Efficiency, Transparency, State University of Surabaya

1. Introduction

The education sector is confronted with enormous hurdles in maintaining the quality of education provided in this age of fast technological innovation and globalization. Quality assurance in education has become a critical focus, serving not only as a mechanism of accountability to stakeholders but also as a means to enhance the quality of teaching and learning (Rosa et al., 2012). In this context, the digitization of quality assurance processes and systems has emerged as a crucial innovation. Information and communication technology has revolutionized how educational institutions manage and deliver education. The adoption of digital tools, including learning

management systems, data analytics, and collaborative platforms, offers the transformative potential to improve the efficiency, accuracy, and transparency of quality assurance practices.

Improving the efficiency, accuracy, and transparency of quality assurance practices is crucial for ensuring that educational institutions meet the evolving demands of stakeholders while maintaining high standards of accountability. Efficient quality assurance processes reduce the administrative burden on staff, freeing resources and time that can be redirected toward core academic and developmental activities. By streamlining workflows, institutions can more effectively monitor compliance with educational standards, respond to areas requiring improvement, and implement corrective measures in a timely manner. Furthermore, accuracy in quality assurance practices ensures that data-driven decisions are based on reliable and precise information. This minimizes the risk of errors that could compromise the credibility of the institution or negatively impact stakeholders, including students, faculty, and external accrediting bodies (Syukur et al., 2023).

Transparency, meanwhile, fosters trust and confidence among stakeholders by making quality assurance practices visible and understandable. Transparent processes enable institutions to demonstrate their commitment to excellence and accountability, providing clear evidence of how decisions are made and how educational standards are upheld. For students, this translates into confidence that their learning environment meets rigorous quality benchmarks. For faculty, it ensures a fair and equitable assessment of their contributions. For external stakeholders such as employers and accrediting agencies, transparency underscores the institution’s reliability and integrity. In sum, improving efficiency, accuracy, and transparency in quality assurance not only enhances institutional credibility but also directly contributes to the overall quality of education and the equitable treatment of all stakeholders (Psomas & Antony, 2017).

Meanwhile, the digitization of quality assurance processes represents a significant shift in how institutions ensure and maintain educational quality standards. This transformation involves leveraging digital technologies to design, implement, and monitor various aspects of quality assurance, such as curriculum development, teaching methodologies, assessments, and student services (Dutta et al., 2021). Through digitization, institutions can collect and analyze data more effectively, enabling data-driven and responsive decision-making. Digital quality assurance systems allow for continuous monitoring of academic and administrative performance, facilitate the identification of areas requiring improvement, and support the development of targeted enhancement strategies.

The Freedom to Learn-Independent Campus Curriculum, also known as Kurikulum Merdeka Belajar Kampus Merdeka (MBKM), is causing a radical change in Indonesia's educational system. This curriculum emphasizes flexibility, interdisciplinary learning, and real-world relevance, allowing students to tailor their educational pathways according to their interests and career aspirations. The implementation of MBKM represents a bold move toward fostering creativity, innovation, and lifelong learning skills, but it also introduces complexity in ensuring consistent quality across diverse programs. This transformation necessitates the adoption of digital technologies to design, implement, and monitor quality assurance processes that align with MBKM's objectives.
In curriculum development, digital technologies enable institutions to create and adapt programs that reflect MBKM's core principles, such as cross-disciplinary learning and the integration of industry-relevant competencies. Online platforms allow collaborative input from educators, industry experts, and policymakers, ensuring that the curriculum remains dynamic and responsive to societal needs. Moreover, data analytics tools can assess the effectiveness of curriculum changes by analyzing trends in student performance and feedback, which is crucial for maintaining alignment with MBKM's goals (Amalia et al., 2018).

Teaching methodologies under MBKM emphasize experiential and project-based learning, where students gain practical experience through internships, community projects, and entrepreneurial activities. Digital technologies facilitate these methodologies by providing platforms for virtual internships, online project management tools, and collaborative spaces for interdisciplinary learning (Perrin & Wang, 2021). Such tools support the flexibility and student agency that MBKM champions while enabling institutions to track and evaluate the quality of these diverse learning experiences.

Assessment practices within MBKM focus on competency-based evaluations that measure not only academic knowledge but also practical skills, creativity, and problem-solving abilities (Farida et al., 2019). Digital assessment tools allow for more accurate, consistent, and scalable evaluations across different programs and institutions. Real-time data collection and analysis also enable adaptive assessments that provide immediate feedback to students, helping them identify areas for improvement and align their learning with their goals (Chassin et al., 2010).

Student services are another critical component of quality assurance under MBKM. With the curriculum's emphasis on student independence and real-world engagement, institutions must provide robust support systems to guide students through their educational journeys. Digital technologies enhance these services by streamlining administrative processes, offering personalized academic advising, and providing platforms for tracking student achievements in internships and other off-campus activities (Ryan, 2015).

By leveraging digital technologies in these areas, Indonesia can effectively implement and monitor the Kurikulum MBKM, ensuring that its ambitious goals are met without compromising quality or equity. This integration of technology into quality assurance processes not only supports the flexibility and innovation inherent in MBKM but also addresses the challenges of managing a decentralized and diverse education system (Goericke, 2020). As a result, digital transformation becomes a critical enabler in realizing MBKM's vision of producing graduates who are adaptive, skilled, and ready to contribute meaningfully to the global economy.

Furthermore, the implementation of digital technologies further extends the capacity of institutions to conduct objective and transparent assessments. Advanced analytical tools and learning management systems provide real-time metrics on performance indicators such as student engagement, learning progress, and teaching effectiveness. These capabilities allow institutions to adapt their teaching approaches and curricula dynamically based on feedback and outcomes. Moreover, digitization ensures consistency and standardization in assessment processes, which is essential for maintaining academic integrity and equity for all learners (Elbadiansyah & Masyni, 2021).

Despite its potential, transitioning to fully digitized quality assurance systems presents several challenges (Lubis & Daryanto, 2019). Institutions face the need for significant investment in technological infrastructure, alongside comprehensive training for staff and faculty to ensure effective system utilization. Concerns regarding data security and privacy add complexity, particularly in protecting sensitive student and staff information. On top of that, achieving a balance between the efficiency of technology and the human-centric nature of education is crucial to ensuring that digitalization supports rather than replaces the personal interactions that are central to teaching and learning.

Building on these premises, this study focuses on the implementation of digitized quality assurance systems at the Professional Education and Certification Institute (LPSP) of the State University of Surabaya. Specifically, the research investigates the impact of digitization on the effectiveness of quality assurance processes, including aspects such as assessment accuracy, process transparency, and student engagement. Additionally, the study identifies the barriers and challenges faced by educational institutions in adopting digital technologies for quality assurance, such as infrastructure limitations, staff training, and resistance to change (Elbadiansyah & Masyni, 2022).

By addressing these challenges, this research aims to provide actionable insights into best practices and strategies for implementing digitization in quality assurance systems. The study contributes to the broader discourse on integrating information technology with educational quality assurance, an area that remains underexplored despite the increasing adoption of digital tools in education. This research is state of the art as it delves into the application of specific digital tools—such as learning management systems and data analytics—in enhancing quality assurance processes. The findings are expected to inform policymakers, education practitioners, and other stakeholders, offering guidance for successfully navigating the social and ethical considerations of digitalization while ensuring high-quality education delivery.

1.1 The Research Problem

To address the challenges and opportunities associated with the digitization of quality assurance systems, this study seeks to explore the current state, implementation process, and impact of digital transformation within the institution. By examining the integration of digital technologies in key aspects of quality assurance—such as curriculum development, teaching methodologies, assessment practices, and student services—this research aims to provide a comprehensive understanding of the effectiveness, efficiency, and transparency of these systems. Furthermore, it seeks to identify the obstacles encountered during implementation and develop actionable recommendations to enhance the digitization process.

Based on these objectives, the research is guided by the following questions:

1. What are the existing conditions of the processes and quality assurance systems at the institution prior to the implementation of digitization?
2. How is the digitization process implemented in the quality assurance system?
3. What technologies and software are utilized in the digitization of the quality assurance system?
4. What are the challenges and obstacles faced by the LPSP at the State University of Surabaya during the digitization process of quality assurance?
5. What is the impact of digitization on the efficiency and effectiveness of quality assurance processes at the institution?
6. What recommendations can be made to improve the implementation of digitization in the quality assurance system at the institution?

2. Method

2.1 Research Design

This study employs a mixed-method approach, combining qualitative and quantitative techniques to comprehensively investigate the digitization of quality assurance processes at the institution. Quantitative methods are utilized to gather numerical data on user satisfaction and system performance through surveys, while qualitative methods, including interviews and document analysis, explore in-depth perspectives on the implementation and challenges of digitization (Creswell, 2014).

2.2 Research Objects

The object of this research consists of individuals or groups directly involved with or impacted by the digitization of quality assurance processes at the institution. These include key stakeholders such as LPSP staff members, leadership, faculty members, students, and other university administrators. Additionally, external stakeholders who interact with the outputs of the quality assurance system, such as accreditation bodies or industry partners, may also be considered.

The institution staff members, including those managing quality assurance processes, form the primary group of respondents, as they are directly responsible for implementing and utilizing the digitized system. Their insights provide critical data on the operational efficiency and user experience of the new system. The leadership team at LPSP is also included to gather information on strategic decision-making, resource allocation, and their perception of digitization's impact on institutional goals.

Faculty members and students, as indirect users or beneficiaries of the system, are vital objects of the study. Faculty members contribute perspectives on how the digitized system aligns with academic standards and administrative workflows, while students offer feedback on the perceived impact on their educational experience. Other university administrators who collaborate with LPSP in quality assurance processes also serve as important respondents to assess inter-departmental integration and system effectiveness.

Including these diverse groups ensures a holistic understanding of the digitization process, capturing both operational and strategic dimensions. The insights gathered will help evaluate the system's performance, identify challenges, and develop actionable recommendations for improving digital quality assurance implementation at the institution.

2.3 Data Collection Instruments

Data are collected using multiple instruments to ensure comprehensive analysis. Surveys are designed to assess user satisfaction, system usability, and perceived impacts of digitization. Semi-structured interview guides are employed to explore detailed experiences and perceptions of key stakeholders, including staff and leadership. Document analysis is conducted on pre-existing quality assurance reports, manuals, and digitization plans to understand baseline conditions and track improvements. Observations of system usage further enrich the data, offering real-time insights into operational workflows.

2.4 Data Analysis

Quantitative data from surveys are analyzed using statistical techniques, including descriptive analysis, correlation analysis, and regression analysis, to identify patterns and measure the system's impact. Qualitative data from interviews and document reviews are subjected to thematic analysis, enabling the identification of key themes and insights. Triangulation of data from multiple sources ensures validity and reliability in the findings, providing a comprehensive understanding of the digitization process (Creswell & Creswell, 2017).

2.5 Research Duration

The research is conducted over a period of six months (February-July of the year 2024), encompassing stages of preparation, data collection, analysis, and reporting. The timeline includes one month for preparation and instrument design, two months for data collection, two months for data analysis, and one month for finalizing and disseminating the research findings.

2.6 Research Location

The study is conducted at the Professional Education and Certification Institute (LPSP) of the State University of Surabaya. This location includes its core units, such as the Training Center, Recognition of Prior Learning Center, Professional Certification Center, Language Center, and Confucius Institute, which are integral to the quality assurance processes being digitized. These centers provide a rich context for exploring the implementation and impact of the digital quality assurance system.

3. Results

This study aimed to evaluate the digitization of quality assurance processes at the institution. The findings are presented based on data collected from surveys, semi-structured interviews, document analysis, and observations of system usage. The respondents included ten leaders, 25 staff members, 25 faculty members, 50 students, and ten university administrators, ensuring a comprehensive perspective on the implementation and impact of the digital quality assurance system.

3.1 User Satisfaction and System Usability

The survey results indicated an overall high level of satisfaction with the digitized quality assurance system, with a mean satisfaction score of 4.7 out of 5 across all user groups. Leaders and staff particularly praised the system's ability to streamline workflows and improve data accessibility. Among the respondents, 94% reported that the system had significantly improved their ability to complete quality assurance tasks efficiently. However, 6% of respondents, primarily students and some staff members expressed challenges with navigating specific system features due to limited prior exposure to similar platforms.

System usability was rated positively, with 92% of users agreeing that the system was intuitive. Nevertheless, interviews revealed that 15% of staff initially struggled with the transition from manual to digital workflows, citing the need for more comprehensive training. Students highlighted the platform's lack of mobile accessibility as a notable drawback, which hindered their ability to engage with the system effectively on the go.

3.2 Baseline Conditions and Improvements

Document analysis of pre-existing quality assurance reports and operational workflows revealed significant inefficiencies in the manual processes. Tasks such as compiling accreditation reports were labor-intensive, often requiring up to three weeks to complete due to fragmented documentation and manual data aggregation. After digitization, the time required for these tasks was reduced by approximately 60%, with improved data accuracy and consistency.

Digitization also addressed long-standing issues in tracking compliance with accreditation standards. Observations of the system in use demonstrated that automated reporting features and dashboard analytics provided real-time insights, allowing leaders to identify areas needing improvement more efficiently.

3.3 Impacts of Digitization on Quality Assurance Processes

This table summarizes the measurable improvements achieved through digitization in efficiency, accuracy, transparency, decision-making, and user engagement while highlighting areas requiring further development, such as student accessibility and involvement.

Table 1: Impacts of Digitization on Quality Assurance Processes

Aspect	Before Digitization	After Digitization	Improvement
Efficiency	Tasks such as compiling accreditation reports took up to three weeks due to fragmented workflows.	Routine tasks are completed 40–70% faster, with automated reporting reducing the time needed for data aggregation.	Significant reduction in time required for tasks.
Accuracy	Data inconsistencies were common due to manual data entry and fragmented documentation systems.	Automated processes reduced errors by 30%, improving the consistency and reliability of quality assurance metrics.	Enhanced data accuracy and reliability.
Transparency	Limited access to documents and metrics created challenges in collaborative decision-making.	Shared access to documents and real-time dashboards facilitated transparency and accountability among stakeholders.	Improved collaboration and trust.
Decision-Making	Decision-making relied on delayed and incomplete data, limiting responsiveness to quality issues.	Real-time analytics and reporting enabled leaders and administrators to make faster, data-driven decisions.	More responsive and informed decisions.
User Engagement	Staff and faculty engagement with quality assurance processes was limited due to inefficiencies.	Increased engagement among staff and faculty due to streamlined workflows and easier access to relevant metrics.	Enhanced participation in quality assurance.
Student Experience	Minimal involvement in quality assurance processes; feedback was rarely incorporated effectively.	Greater involvement through real-time feedback tools, though accessibility issues (e.g., mobile use) limited engagement.	Moderate improvement, with areas for growth.

3.4 Challenges and Unexpected Findings

This table outlines the challenges and unexpected findings encountered during the digitization process, their impacts on stakeholders, and actionable suggestions to address these issues for future improvements.

Table 2: Challenges and Unexpected Findings

Category	Description	Impact	Suggested Mitigation
Training Needs	25% of respondents reported difficulties adapting to the digital system due to limited prior technology use.	Slower adoption and suboptimal utilization of the system in the early phases.	Conduct regular training sessions and provide on-demand tutorials for all user groups.
Infrastructure Gaps	Limited internet bandwidth and outdated hardware in certain areas hindered seamless access to the system.	Delays in system use, particularly for off-campus users or those in remote locations.	Invest in infrastructure upgrades, including enhanced internet connectivity and modern hardware.
Data Privacy Concerns	Gaps in cybersecurity protocols raised concerns about the protection of sensitive student and institutional data.	Potential risk of data breaches, impacting stakeholder trust.	Strengthen cybersecurity measures, including encrypted data storage and regular system audits.
System Complexity	Some users (8%) found the system overly complex, making it difficult to navigate certain features.	Reduced efficiency for specific user groups, particularly students and new staff.	Simplify user interface design and offer role-specific customization options.
Resistance to Change	A small proportion of staff and faculty expressed skepticism about the effectiveness of digitized processes.	Initial resistance delayed the full-scale adoption of the system.	Engage stakeholders early, emphasizing system benefits and gathering user feedback during deployment.
Balancing Automation with Personalization	10% of faculty members expressed concern that automated processes reduced opportunities for personalized decision-making.	The perception that the system prioritizes efficiency over nuanced, context-sensitive decisions.	Integrate customizable features that allow users to override or tailor automated processes.
Student Accessibility	Students reported challenges accessing the system on mobile devices, limiting engagement with certain features.	Reduced participation and slower adoption among the student body.	Develop a mobile-friendly version of the platform to increase accessibility for students.

3.5 Statistical Nonsignificant Findings

While significant improvements were observed in efficiency and accuracy metrics, the impact on user engagement varied across groups. For example, while staff and leaders showed a statistically significant increase in system engagement ($p < 0.05$), student engagement exhibited no statistically significant change ($p = 0.08$). This result highlights the importance of tailoring system features to meet the diverse needs of all user groups, including students.

3.6 Recommendations for Improvement

This table provides actionable recommendations for improving the digitized quality assurance system, ensuring greater efficiency, usability, and stakeholder satisfaction.

Table 3: Recommendations for Improvement

Category	Recommendation	Expected Outcome
Training Programs	Conduct regular and inclusive training sessions tailored to specific user groups (staff, faculty, students).	Enhanced user competency and confidence in utilizing the system effectively.
Infrastructure Upgrades	Invest in modern hardware and improved internet connectivity, especially in remote or off-campus locations.	Seamless access to the system and improved performance for all users.
Mobile Accessibility	Develop and optimize a mobile-friendly version of the system for better access on smartphones and tablets.	Increased engagement and participation, particularly among students and on-the-go users.
Cybersecurity Measures	Strengthen data privacy and security protocols, including encryption, regular audits, and user education.	Increased stakeholder trust and reduced risk of data breaches.
Simplified User Interface	Redesign the system interface to make it more intuitive and customizable based on user roles and needs.	Improved usability, reducing complexity for users unfamiliar with advanced digital systems.
Stakeholder Engagement	Involve stakeholders early in system development and gather feedback during implementation.	Increased buy-in, smoother adoption, and a system better aligned with user expectations.
Customization Options	Introduce features that allow users to personalize or override automated processes where necessary.	Balance between automation and the need for nuanced, context-sensitive decision-making.
Performance Monitoring	Implement regular system performance reviews to identify and address technical issues promptly.	Improved system reliability and user satisfaction through proactive maintenance and updates.
User Support Services	Establish dedicated support channels for real-time issue resolution, such as a help desk or online chat.	Reduced downtime and quicker resolution of user challenges.

4. Discussion

This study evaluated the digitization of quality assurance processes at the Professional Education and Certification Institute (LPSP) of the State University of Surabaya. The findings demonstrate significant improvements in efficiency, accuracy, and transparency following the adoption of digital systems while also highlighting challenges and areas for enhancement. The discussion provides an in-depth interpretation of the results, their implications for the institution, and their broader relevance to higher education.

The results indicate that digitization substantially improved the efficiency of quality assurance processes. Tasks that previously required weeks to complete were streamlined through automation, reducing completion times by up to 70%. Automated reporting and real-time analytics eliminated the inefficiencies of manual data aggregation, enabling faster and more informed decision-making. These findings align with previous research emphasizing the potential of digital technologies to optimize administrative workflows in higher education (Biancarosa & Griffiths, 2012).

Despite these gains, the study revealed a learning curve among some users during the transition to the new system. Approximately 25% of staff reported initial difficulties adapting to the digital platform, underscoring the need for comprehensive training programs. This challenge is consistent with literature suggesting that user preparedness is a critical factor in successful digital transformations.

The transition from manual to digital processes significantly reduced data inconsistencies, with a reported 30% decrease in errors. Automated data entry and reporting features enhanced the reliability of quality assurance metrics, which is essential for compliance with accreditation standards and institutional accountability. Moreover,

the system improved transparency by providing shared access to reports and dashboards, facilitating collaborative decision-making across stakeholder groups (Bayne & Jandrić, 2017).

These findings reflect broader trends in the adoption of digital technologies for quality assurance. However, the study identified areas where transparency could be further improved, particularly for students, who reported limited access to certain features due to mobile compatibility issues (Memarian & Doleck, 2023). Addressing these concerns through enhanced system design could further align the system with principles of inclusivity and equity (Ramírez & Tejada, 2018).

The study highlighted several challenges during the implementation of digitization. Infrastructure limitations, such as inadequate internet bandwidth and outdated hardware, hindered the system's seamless adoption, particularly in remote or off-campus settings. Data privacy concerns also emerged as a critical issue, with leaders emphasizing the need for robust cybersecurity measures to protect sensitive information.

Another unexpected finding was the tension between automation and personalization. While automated processes improved efficiency, some faculty members expressed concerns about reduced opportunities for nuanced, context-sensitive decision-making. This underscores the importance of balancing technological efficiency with human oversight to maintain the integrity of educational processes.

User satisfaction with the digital system was generally high, with an average score of 4.7 out of 5. Leaders and staff reported significant benefits in terms of usability and time savings, while students appreciated increased access to resources and feedback mechanisms. However, a minority of users—particularly students—reported challenges related to system navigation and accessibility. These findings suggest that while the system meets the needs of most users, targeted improvements are necessary to ensure inclusivity and engagement for all stakeholder groups.

The findings have important theoretical and practical implications. Theoretically, they contribute to the growing body of literature on digital transformation in higher education by providing evidence of its impact on quality assurance processes. The study reinforces theories of organizational change, highlighting the need for capacity-building and stakeholder engagement to ensure the successful adoption of digital systems.

Practically, the study offers actionable insights for institutions seeking to digitize their quality assurance processes. Recommendations such as infrastructure upgrades, enhanced training programs, and mobile-friendly design can guide implementation strategies. The findings also underscore the importance of balancing technological automation with opportunities for human input, ensuring that digitization supports rather than replaces critical decision-making processes.

While the study provides valuable insights, it has certain limitations. While comprehensive within the institution, the sample size may not fully capture the diversity of experiences across different institutional contexts. Additionally, the study primarily focused on short-term impacts, leaving room for future research on digital quality assurance systems' long-term sustainability and scalability.

Future studies could explore integrating advanced technologies, such as artificial intelligence and machine learning, to enhance quality assurance processes further. Comparative studies across institutions with varying levels of digital maturity would also provide a broader understanding of best practices and challenges in digital transformation.

4. Conclusion

The digitization of quality assurance processes at the institution has delivered measurable improvements in efficiency, accuracy, and transparency, demonstrating its potential as a model for other institutions. However, challenges such as infrastructure limitations, user adaptation, and balancing automation with personalization highlight the complexity of implementing digital systems in higher education. By addressing these challenges and

building on the recommendations provided, institutions can leverage digitization to achieve sustainable educational quality and accountability improvements. This study underscores the transformative potential of digital technologies while emphasizing the need for thoughtful and inclusive implementation strategies.

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