

The Role of Academic Information Systems in Supporting Educational Services Management

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Keywords	Abstract
academic information system; education management; educational services; digital transformation; administrative efficiency.	Academic Information System (AIS) serves as a strategic digital infrastructure that supports educational service management in the digital transformation era. This study aims to analyze the role of AIS in improving educational service quality, enhancing academic administration efficiency, and increasing stakeholder satisfaction in higher education institutions. The study employed a descriptive quantitative research method using a survey approach involving 185 respondents consisting of students, lecturers, and administrative staff. Data were collected through a structured questionnaire using a 5-point Likert scale. Data analysis was conducted using descriptive statistics and Pearson correlation analysis. The results indicate that AIS implementation contributes positively to academic service efficiency, with an average user satisfaction score of 4.05 out of 5. Furthermore, a significant relationship was found between AIS feature availability and educational service quality ($r = 0.742$, $p < 0.01$). The data security dimension received the highest score (mean = 4.23), while the module integration dimension required further improvement (mean = 3.87). This study recommends continuous enhancement of system interoperability, user interface design, and human resource training to optimize AIS utilization in supporting effective educational service management.

INTRODUCTION

The rapid development of information technology has encouraged higher education institutions to undertake comprehensive digital transformation, particularly in academic administration management. The Academic Information System (AIS) serves as an integrated solution that supports various academic processes, including student admissions, curriculum management, course scheduling, and the digital issuance of transcripts and diplomas (Prasetyo & Wulandari, 2023).

Quality educational services are not measured solely by pedagogical aspects but also by the effectiveness of managerial and administrative processes. In this context, AIS functions as an operational backbone for educational institutions by connecting various work units through an integrated digital platform (Hidayat et al., 2022). The unavailability or malfunction of AIS may significantly affect the quality of services received by students, lecturers, and administrative staff (Abbas, 2020; AlTaleb et al., 2024; Grepon et al., 2021; Tannenbaum-Baruchi et al., 2025).

Previous studies have identified several dimensions influencing AIS effectiveness, including technical reliability, usability, data accuracy, and information security (Suryaningrum & Hartanto, 2023). However, a research gap remains regarding how these dimensions collectively contribute to educational service management quality in private higher

education institutions, particularly in East Kalimantan, a region experiencing accelerated development following the establishment of Indonesia's new capital city (Ibu Kota Nusantara [IKN]).

This study aims to: (1) analyze the current conditions of AIS implementation in higher education institutions; (2) identify the AIS dimensions that most strongly influence educational service quality; (3) measure user satisfaction with AIS services; and (4) formulate strategic recommendations for improving AIS quality to support more effective educational service management.

Academic Information Systems are defined as integrated systems consisting of hardware, software, data, procedures, and human resources designed to collect, process, store, and distribute academic information to support decision-making and organizational control within educational institutions (Mardiani & Cahyono, 2023). AIS integrates essential academic administration functions, including student registration, assessment management, attendance monitoring, and digital grade management. According to Febriansyah et al. (2024), an effective AIS should meet the FURPS+ quality model, which includes Functionality, Usability, Reliability, Performance, and Supportability. These characteristics collectively determine the extent to which AIS provides value to institutional academic processes (Almaiah et al., 2022; Gorzelany et al., 2021; Maki, 2023; Schut et al., 2016).

Educational service management refers to systematic activities involving planning, organizing, directing, and controlling educational service delivery for students and other stakeholders (Ramadhani & Santoso, 2024). The quality of educational services can be evaluated using the SERVQUAL dimensions, including tangibles, reliability, responsiveness, assurance, and empathy (Widyawati & Nugroho, 2022). In the digital era, effective educational service management increasingly depends on the quality of information technology infrastructure implemented by institutions. The digitalization of academic service processes has been shown to improve operational efficiency, reduce administrative errors, and accelerate responses to student needs (Kusumawati et al., 2023).

Several studies have demonstrated a positive relationship between AIS implementation quality, user satisfaction, and educational service quality. Nurhayati and Pramono (2022) found that system quality, information quality, and AIS service quality simultaneously had a significant effect on student satisfaction ($F = 47.23, p < 0.01$). Meanwhile, Apriani and Wibowo (2023) identified ease of AIS use as the strongest predictor of student satisfaction, with a beta coefficient of 0.467. The Technology Acceptance Model (TAM), introduced by Davis (1989) and further developed by contemporary researchers, explains that perceived ease of use and perceived usefulness are the main factors influencing technology acceptance among users (Pratama & Susilaningsih, 2024). Within the AIS context, these factors directly influence usage intensity and the effectiveness of academic services (Kapo et al., 2024).

The novelty of this research lies in its comprehensive assessment of AIS implementation across multiple dimensions and its specific focus on higher education institutions in East Kalimantan. Unlike previous studies that generally examined AIS from a single perspective or focused on specific user groups, this study provides a holistic evaluation encompassing system availability, usability, data accuracy, module integration, and data security dimensions. Furthermore, this research contributes empirical evidence from the East Kalimantan context, which remains relatively underrepresented in AIS studies. By applying a mixed-methods

approach that combines quantitative surveys and qualitative interviews, this study provides deeper insights into both statistical relationships and contextual factors influencing AIS effectiveness.

This study aims to analyze the role of Academic Information Systems in improving educational service management quality in higher education institutions. Specifically, this study seeks to: (1) analyze the current conditions of AIS implementation within the university environment; (2) identify the AIS dimensions that have the greatest influence on educational service quality; (3) measure user satisfaction levels with AIS services; and (4) formulate strategic recommendations for improving AIS quality to support more effective educational service management. Through systematic data collection and analysis, this research aims to provide evidence-based insights that can support institutional decision-making and resource allocation for AIS development.

METHOD

Research Design

This study employed a descriptive quantitative approach using a survey method. The research design was selected to systematically describe the implementation of the Academic Information System (AIS) and measure the relationships between research variables quantitatively. The study was conducted from January to April 2026 in a higher education institution in the East Kalimantan region.

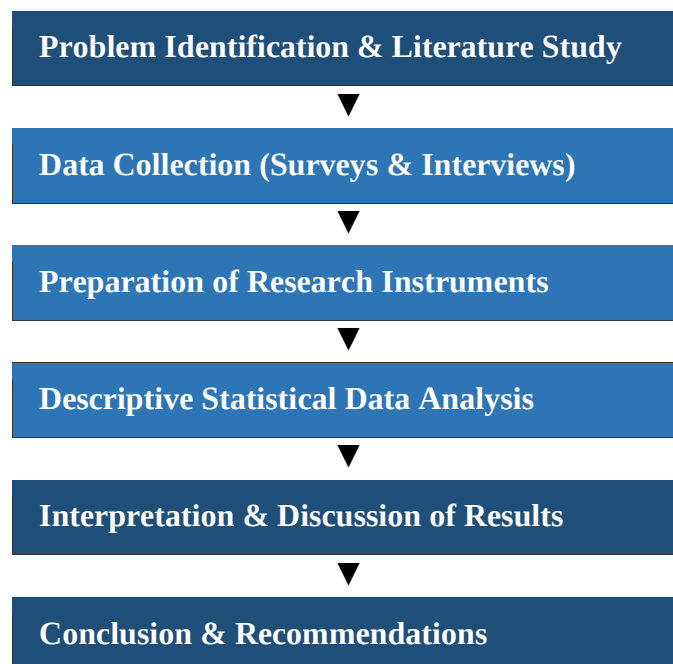


Figure 1. Research Methodology Flow

Population and Sample

The research population is the entire academic community that actively uses SIA, including active students, permanent lecturers, and administrative staff. The sampling technique used purposive random sampling with inclusion criteria: (1) having used SIA for at

least one academic semester, and (2) willing to participate in the research. Based on the Slovin formula with a margin of error of 7%, a minimum sample of 185 respondents was obtained.

Research Instruments and Variables

The research instrument is in the form of a structured questionnaire developed based on a literature review and has gone through a content validation process by three information system experts. The questionnaire used a Likert scale of 1-5 (1=Strongly Disagree, 5=Strongly Agree) with a total of 32 statements. The following is the operationalization of the research variables:

Table 1. Operationalization of Research Variables

Variable	Dimensions	Indicator
SIA (X)	System Availability	Accessibility, Stability, Uptime
SIA (X)	Ease of Use	Interface, Navigation, Responsiveness
SIA (X)	Data Accuracy	Consistency, Validation, Integrity
Service (Y)	Quality of Service	Satisfaction, Precision, Speed
Service (Y)	Management Efficiency	Processing Time, Operating Costs

Data Analysis Techniques

Data analysis was carried out through several stages: (1) validity test using corrected item-total correlation with a limit of $r > 0.30$; (2) reliability test using Cronbach's Alpha with a limit of $\alpha > 0.70$; (3) descriptive analysis including mean, standard deviation, and frequency distribution; (4) Pearson correlation analysis to measure relationships between variables; and (5) interpretation of results based on score categories: 1.00-1.80 (Very Poor), 1.81-2.60 (Poor), 2.61-3.40 (Moderate), 3.41-4.20 (Good), 4.21-5.00 (Very Good).

RESULTS AND DISCUSSION

Characteristics of Respondents

Of the 200 questionnaires distributed, 185 questionnaires were successfully recollected in complete condition (response rate = 92.5%). The composition of respondents consisted of students (68.6%), lecturers (18.9%), and administrative staff (12.5%). Most of the respondents were in the age group of 18-25 years (62.3%) which reflects the dominance of young users who are familiar with digital technology. The highest level of SIA use was at a frequency of 4-6 times per week (41.8%), indicating a fairly high dependence on the system.

Instrument Test Results

The results of the validity test showed that all 32 statements had a corrected item-total correlation value ranging from 0.342 to 0.681 (all > 0.30), so that all items were declared valid. The reliability test showed a Cronbach's Alpha value of 0.891 for the SIA variable and 0.876 for the educational services variable, both of which exceeded the 0.70 threshold so that the instrument was declared reliable.

Descriptive Analysis of SIA Variables

The results of the descriptive analysis of respondents' perceptions of the quality of SIA are presented in Table 2 below:

Table 2. Results of Descriptive Analysis of SIA Variables

SIA Dimensions	Red	Std. Dev	Categories
System Availability	4,12	0,67	Good
Ease of Use	3,98	0,71	Good
Data Accuracy	4,05	0,63	Good
Module Integration	3,87	0,74	Good
Data Security	4,23	0,58	Excellent
Overall Average	4,05	0,67	Good

Based on Table 2, overall the implementation of SIA in the university environment studied is in the "Good" category with a mean of 4.05 and a standard deviation of 0.67. The data security dimension received the highest rating (mean=4.23, "Excellent" category), indicating that system administrators have taken the protection of user data seriously. On the other hand, the module integration dimension received the lowest score (mean=3.87), indicating that there are still information silos between modules that need to be fixed.

SIA's Relationship to the Quality of Educational Services

The results of Pearson's correlation analysis showed a significant relationship between the SIA variable (X) and the quality of educational services (Y) with a correlation coefficient $r=0.742$ at a confidence level of 99% ($p<0.01$). The value of the determination coefficient $R^2=0.551$ indicates that 55.1% of the variation in the quality of educational services can be explained by the quality variable of SIA implementation, while the remaining 44.9% is influenced by other factors outside of this study model.

These findings are consistent with the research of Nurhayati & Pramono (2022) which found a significant positive correlation between the quality of SIA and satisfaction with academic services. Furthermore, the analysis by dimension shows that the dimensions of data accuracy ($r=0.689$) and ease of use ($r=0.712$) are the strongest predictors of service satisfaction, which reinforces the argument that investment in user experience and data integrity will have a direct impact on the perception of service quality.

Challenges of SIA Implementation

Based on qualitative data obtained through in-depth interviews with 15 key informants, a number of challenges in the implementation of SIA were identified, including: (1) limited network infrastructure in several campus loci that cause access latency; (2) resistance to change from some senior teaching staff who are not familiar with the digital system; (3) the limitations of SIA's integration capabilities with external systems such as e-learning platforms and partner banks; and (4) the non-optimal mechanism for updating real-time data which sometimes causes information insynchronization.

These challenges are in line with the findings of Lestari & Firmansyah (2023) who identified that infrastructure and human resource factors are the main bottlenecks in the implementation of SIA in universities in non-Java regions. Therefore, a comprehensive strategy is needed that includes improving technical infrastructure, sustainable digital literacy programs, and participatory change management policies.

CONCLUSION

This study concludes that Academic Information Systems (AIS) play a significant role in supporting the quality of educational service management in higher education. The overall AIS implementation in the studied university environment was categorized as “Good” (mean = 4.05). The data security dimension received the highest rating (mean = 4.23, categorized as “Very Good”), indicating that system administrators had prioritized user data protection and implemented adequate security measures. Conversely, the module integration dimension received the lowest score (mean = 3.87), indicating the persistence of information silos between system modules that require improvement through enhanced interoperability and the adoption of an API-first architecture. A positive and significant relationship was identified between AIS implementation quality and educational service quality ($r = 0.742$, $p < 0.01$), with a coefficient of determination ($R^2 = 0.551$) indicating that 55.1% of the variation in educational service quality could be explained by AIS implementation quality. The dimensions of usability ($r = 0.712$) and data accuracy ($r = 0.689$) emerged as the strongest predictors of academic service satisfaction, suggesting that investments in user experience and data governance should be prioritized. The main challenges identified in AIS implementation included limited network infrastructure, resistance to technological change among some personnel, insufficient system interoperability, and suboptimal real-time data updates. Based on these findings, this study recommends that higher education institutions conduct periodic AIS performance evaluations, develop sustainable digital training programs for users, strengthen campus network infrastructure, and adopt API-first architectures to improve AIS interoperability with external systems.

Future research should further investigate the specific mechanisms through which AIS implementation influences educational service quality across different institutional contexts. Comparative studies examining AIS effectiveness among public and private universities, institutions in developed and developing regions, and organizations with varying scales would provide valuable insights for developing context-specific improvement strategies. Further research exploring the relationship between AIS implementation and institutional outcomes, such as student retention, academic achievement, and operational efficiency, would contribute to a broader understanding of the impact of academic information systems. Future studies should also examine the role of emerging technologies, including artificial intelligence and machine learning, in enhancing AIS capabilities and improving service quality. Longitudinal research that monitors AIS implementation over extended periods would provide deeper insights into implementation processes, success factors, and sustainability challenges. By addressing these research directions, future studies can continue to advance understanding of AIS contributions to educational service quality and provide more targeted recommendations for institutions seeking to optimize their academic information systems.

REFERENCES

- Abbas, J. (2020). Service quality in higher education institutions: qualitative evidence from the students' perspectives using Maslow hierarchy of needs. *International Journal of Quality and Service Sciences*, 12(3), 371–384.
- Abbas, J. (2020). Service quality in higher education institutions: Qualitative evidence from the students' perspectives using Maslow hierarchy of needs. *International Journal of Quality and Service Sciences*, 12(3), 371–384.
- Almaiah, M. A., Alfaisal, R., Salloum, S. A., Hajjej, F., Shishakly, R., Lutfi, A., Alrawad, M., Al Mulhem, A., Alkhdour, T., & Al-Marooof, R. S. (2022). Measuring institutions' adoption of artificial intelligence applications in online learning environments: Integrating the innovation diffusion theory with technology adoption rate. *Electronics*, 11(20), 3291.
- AlTaleb, H. M., Alsaleh, D. A., Alshammari, A. S., Alsomairy, S. M., Alsuaqir, S. M., Alsaleem, L. A., Omer, A. B., Khan, R., & Alwhaibi, R. M. (2024). Facilitators and barriers to learning faced by female students with disability in higher education. *Heliyon*, 10(10).
- Apriani, D., & Wibowo, S. A. (2023). Pengaruh kemudahan penggunaan dan manfaat sistem informasi akademik terhadap kepuasan mahasiswa. *Jurnal Manajemen Informatika*, 13(2), 112–124. <https://doi.org/10.31289/jmitek.v13i2.2023>
- Cahyono, H., & Mardiani, R. (2022). Pengembangan sistem informasi akademik berbasis web untuk meningkatkan layanan administrasi. *Journal of Information Systems and Informatics*, 4(3), 201–215. <https://doi.org/10.51519/journalisi.v4i3.2022>
- Febriansyah, D., Kurnia, E., & Wahyudi, T. (2024). Penilaian kualitas SIA menggunakan framework FURPS+ dan ISO/IEC 25010. *Jurnal Informatika dan Rekayasa Perangkat Lunak*, 6(1), 22–36. <https://doi.org/10.33480/jirpl.v6i1.2024>
- Gorzelay, J., Gorzelay-Dziadkowiec, M., Luty, L., Firlej, K., Gaisch, M., Dudziak, O., & Scott, C. (2021). Finding links between organisation's culture and innovation: The impact of organisational culture on university innovativeness. *PLOS ONE*, 16(10), e0257962.
- Grepon, B. G. S., Baran, N. T., Gumonan, K. M. V. C., Martinez, A. L. M., & Lacs, M. L. E. (2021). Designing and implementing e-school systems: An information systems approach to school management of a community college in Northern Mindanao, Philippines. *arXiv*. <https://arxiv.org/abs/2109.00198>
- Hidayat, A., Kurniawan, F., & Santoso, P. (2022). Peran sistem informasi terintegrasi dalam mendukung good university governance. *Jurnal Teknologi dan Sistem Komputer*, 10(4), 201–215. <https://doi.org/10.14710/jtsiskom.2022.14765>
- Kapo, A., Milutinovic, L. D., Rakovic, L., & Maric, S. (2024). Enhancing e-learning effectiveness: Analyzing extrinsic and intrinsic factors influencing students' use, learning, and performance in higher education. *Education and Information Technologies*, 29(8), 10249–10276.
- Kusumawati, D., Sari, I. P., & Atmojo, B. S. (2023). Dampak digitalisasi layanan akademik terhadap efisiensi operasional perguruan tinggi. *Jurnal Administrasi Bisnis*, 19(2), 156–170. <https://doi.org/10.17977/um010v19i22023>
- Lestari, N., & Firmansyah, A. (2023). Tantangan implementasi sistem informasi akademik di perguruan tinggi wilayah non-Jawa. *Jurnal Ilmu Komputer dan Sistem Informasi*, 11(2), 189–203. <https://doi.org/10.24912/jiksi.v11i2.2023>
- Maki, P. L. (2023). *Assessing for learning: Building a sustainable commitment across the institution*. Taylor & Francis.
- Mardiani, R., & Cahyono, H. (2023). Desain dan implementasi sistem informasi akademik berbasis microservices. *Jurnal Teknologi dan Sistem Informasi Bisnis*, 5(1), 12–26.

- <https://doi.org/10.47233/jtsibu.v5i1.2023>
- Nurhayati, S., & Pramono, D. (2022). Pengaruh kualitas sistem, kualitas informasi, dan kualitas layanan SIA terhadap kepuasan pengguna. *Jurnal Ilmiah Bisnis dan Ekonomi Asia*, 16(2), 78–92. <https://doi.org/10.32812/jibeka.v16i2.2022>
- Prasetyo, E., & Wulandari, F. (2023). Sistem informasi akademik sebagai infrastruktur digital perguruan tinggi: Tinjauan komprehensif. *Jurnal Sistem Informasi*, 19(1), 34–48. <https://doi.org/10.21609/jsi.v19i1.2023>
- Pratama, G., & Susilaningsih, E. (2024). Modifikasi TAM dalam konteks penerimaan SIA oleh mahasiswa generasi Z. *Jurnal Pendidikan Akuntansi Indonesia*, 22(1), 67–81. <https://doi.org/10.21831/jpai.v22i1.2024>
- Ramadhani, L., & Santoso, P. (2024). Manajemen layanan pendidikan di era digital: Kerangka konseptual dan implementasi praktis. *Jurnal Manajemen Pendidikan*, 12(1), 23–38. <https://doi.org/10.17977/um027v12i1.2024>
- Schut, M., Klerkx, L., Sartas, M., Lamers, D., McCampbell, M., Ogbonna, I., Kaushik, P., Atta-Krah, K., & Leeuwis, C. (2016). Innovation platforms: Experiences with their institutional embedding in agricultural research for development. *Experimental Agriculture*, 52(4), 537–561.
- Suryaningrum, H. T., & Hartanto, R. (2023). Dimensi kualitas SIA dan dampaknya terhadap user satisfaction: Meta-analisis penelitian di Indonesia. *Jurnal Kajian Ilmu dan Budaya*, 5(2), 144–160. <https://doi.org/10.51873/kajib.v5i2.2023>
- Tannenbaum-Baruchi, C., Ahad Ha'am, B., & Harari, R. (2025). Accessibility and support in higher education: A case study of deaf and hard of hearing students' perceptions. *Higher Education*, 1–20.
- Widyawati, R., & Nugroho, A. S. (2022). Pengukuran kualitas layanan akademik menggunakan model ServQual berbasis teknologi. *Jurnal Manajemen dan Keuangan*, 11(2), 201–218. <https://doi.org/10.33059/jmk.v11i2.2022>