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The Effect of System Quality and Information Quality on User Satisfaction with Academic Information Systems

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ABSTRACT

This study aims to examine the effect of system quality and information quality on user satisfaction with Academic Information Systems (AIS) in Indonesia. A quantitative approach was employed using survey data collected from 150 respondents who actively use AIS in higher education institutions. Data were gathered through a structured questionnaire measured using a Likert scale. The analysis was conducted using IBM SPSS Statistics version 25, including validity and reliability tests, classical assumption tests, and multiple linear regression analysis. The results indicate that both system quality and information quality have a positive and significant effect on user satisfaction, both partially and simultaneously. System quality contributes through aspects such as ease of use, reliability, and responsiveness, while information quality is reflected in accuracy, relevance, and timeliness. Furthermore, information quality was found to have a stronger influence compared to system quality. The coefficient of determination (R^2) shows that 48.3% of user satisfaction can be explained by the two independent variables. These findings highlight the importance of improving both system performance and the quality of information provided to enhance user satisfaction. This study provides practical implications for universities and system developers in optimizing academic information systems to better meet user needs and expectations.

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1. INTRODUCTION

The rapid diffusion of digital technologies has fundamentally reshaped governance, service delivery, and decision-making processes within higher education institutions. In this transformation, Academic Information Systems (AIS) have emerged as critical digital infrastructures that integrate academic and administrative functions, enabling universities to manage student data [1], [2], course registration, grading, scheduling, and institutional communication more efficiently. In emerging economies such as Indonesia, the deployment of AIS is not merely an operational enhancement but a strategic imperative to improve institutional competitiveness, transparency, and accountability in an increasingly digital and data-driven educational landscape. Consequently, the effectiveness of AIS has

become a central concern for both policymakers and university management [3].

Despite the widespread adoption of AIS, empirical evidence indicates that many institutions continue to experience persistent challenges related to system performance and information output. Users frequently report issues such as system instability, slow response times, inaccurate or incomplete data, and delays in information updates. These deficiencies not only hinder operational efficiency but also undermine user trust and satisfaction [4], [5]. In the context of information systems research, user satisfaction is widely recognized as a key indicator of system success, reflecting the extent to which a system meets user expectations and supports task performance. Therefore, identifying and analyzing the determinants of user satisfaction is essential for ensuring the sustainability and effectiveness of AIS implementation.

Within the information systems literature, system quality and information quality are consistently identified as two core dimensions influencing user satisfaction. System quality refers to the technical and functional performance of the system, encompassing attributes such as usability, reliability, flexibility, and response time [6], [7]. A system characterized by high quality enables seamless interaction, minimizes errors, and enhances user efficiency. In contrast, information quality pertains to the characteristics of the system output, including accuracy, relevance, completeness, consistency, and timeliness [6], [8]. High-quality information is essential for supporting decision-making processes and ensuring that users can rely on the system for academic planning and evaluation. The interplay between these two dimensions is critical, as both the system's technical performance and the quality of its outputs jointly shape user perceptions and experiences.

The theoretical underpinning of this study is anchored in the DeLone and McLean Information Systems Success Model, which posits that system quality and information quality are primary antecedents of user satisfaction and system use. This model has been extensively validated across various contexts, including education, and provides a robust framework for evaluating information system success. According to this model, improvements in system and information quality are expected to enhance user satisfaction, which subsequently contributes to greater system utilization and organizational benefits. However, the relative influence of these dimensions may vary depending on contextual factors such as user characteristics, institutional settings, and technological maturity.

Prior empirical studies have produced inconsistent findings regarding the relative importance of system quality and information quality in influencing user satisfaction. Some studies emphasize the dominance of system quality, particularly in environments where user interaction with the system is intensive, while others highlight the critical role of information quality in supporting decision-making accuracy. In the Indonesian higher education context, research on AIS remains relatively limited and fragmented, with a lack of comprehensive empirical studies that simultaneously examine these two dimensions. This gap underscores the need for further investigation to provide context-specific insights and contribute to the broader discourse on information system success in developing countries.

Accordingly, this study aims to analyze the effect of system quality and information quality on user satisfaction with Academic Information Systems in Indonesia. Employing a quantitative research design, data were collected from 150 AIS users through structured questionnaires measured using a Likert scale. The data were subsequently analyzed using IBM SPSS Statistics version 25 to test the proposed relationships and ensure the robustness of the findings. By focusing on both technical and informational dimensions, this study seeks to provide a more holistic understanding of the factors influencing AIS effectiveness.

The contributions of this study are twofold. From a theoretical perspective, it extends the application of the DeLone and

McLean model within the context of Indonesian higher education, offering empirical evidence that enriches the literature on information system success in developing economies. From a practical standpoint, the findings provide actionable insights for university administrators and system developers in prioritizing improvements in system design and information management. Enhancing both system performance and information quality is expected to increase user satisfaction, promote system adoption, and ultimately improve institutional performance.

In summary, as higher education institutions increasingly rely on digital systems to support their core functions, the evaluation of AIS effectiveness becomes critically important. This study provides a rigorous examination of the determinants of user satisfaction, contributing to the ongoing efforts to optimize academic information systems and ensure their alignment with user needs and institutional objectives.

2. LITERATURE REVIEW

2.1 Academic Information Systems (AIS)

Academic Information Systems (AIS) are integrated digital platforms designed to manage and support academic and administrative processes within higher education institutions, encompassing functions such as student registration, course scheduling, grade reporting, academic records management, and communication among stakeholders [9]. The implementation of AIS enables universities to streamline operational processes, minimize manual errors, and enhance the efficiency of service delivery [8], [10]. In the Indonesian context, the adoption of AIS has become increasingly critical as higher education institutions strive to improve institutional performance and respond to the demands of digital transformation. However, the effectiveness of AIS is largely determined by the system's functional performance and the perceived usefulness of the information it generates. Therefore, a comprehensive evaluation of AIS from the perspectives of system quality, information quality, and user satisfaction is essential to ensure its optimal utilization and long-term success.

2.2 User Satisfaction

User satisfaction is one of the most widely used indicators to measure the success of an information system, as it reflects the extent to which users perceive that a system meets their expectations and needs. A high level of user satisfaction indicates that the system is effective, reliable, and capable of supporting user tasks, whereas low satisfaction signals potential deficiencies in system performance or information delivery [11], [12]. Within the framework of the DeLone and McLean Information Systems Success Model, user satisfaction is positioned as a central outcome variable influenced by system quality and information quality, highlighting that satisfied users are more likely to continue using the system and perceive it as beneficial to their activities. In the context of Academic Information Systems (AIS), user satisfaction is particularly critical as it directly affects students' and lecturers' willingness to depend on the system for academic processes. Furthermore, user satisfaction is commonly assessed through

indicators such as perceived usefulness, ease of use, overall user experience, and the system's ability to fulfill user needs, with higher satisfaction levels fostering trust and contributing to the long-term success and sustainability of the system.

2.3 System Quality

System quality refers to the desirable characteristics of an information system, emphasizing its technical and functional performance, including dimensions such as usability, reliability, response time, flexibility, and accessibility. A high-quality system is typically characterized by ease of use, minimal errors, fast processing speed, and consistent performance, enabling users to interact with the system efficiently and without difficulty [10], [11]. Conversely, systems that experience frequent downtime, slow response times, or complex interfaces tend to generate user frustration and reduce satisfaction levels. In the context of Academic Information Systems (AIS), system quality is particularly critical because users—such as students and lecturers—interact with the system on a daily basis for activities like course registration, schedule management, and grade access; thus, any deficiencies in system performance can disrupt academic processes and negatively influence user perceptions. Empirical evidence from previous studies consistently demonstrates that system quality has a significant effect on user satisfaction, as well-designed systems enhance user experience, improve operational efficiency, and foster positive attitudes toward system usage.

2.4 Information Quality

Information quality refers to the quality of the output generated by an information system, emphasizing characteristics such as accuracy, relevance, completeness, timeliness, and consistency, which are essential for enabling users to make informed decisions and perform their tasks effectively. In the context of Academic Information Systems (AIS), information quality plays a crucial role because users rely heavily on accurate and up-to-date information for academic planning and decision-making; for example [10], [11], inaccurate course schedules, delayed grade updates, or incomplete academic records can lead to confusion and dissatisfaction. Information quality is often regarded as equally important as, or even more critical than, system quality, since a technically well-functioning system will still fail to meet user expectations if the information it provides is inaccurate or irrelevant. Therefore, maintaining high information quality is fundamental to achieving user satisfaction. Empirical evidence further supports this view, demonstrating that information quality has a significant impact on user satisfaction, as users who perceive the information as reliable and useful are more likely to trust the system and continue using it consistently.

2.5 Hypothesis Development

The relationship between system quality, information quality, and user satisfaction has

been widely established in information systems research, with the DeLone and McLean Information Systems Success Model providing a comprehensive framework to explain how these variables interact. According to this model, system quality and information quality directly influence user satisfaction, which subsequently affects system usage and overall system success [13], [14]. System quality contributes to user satisfaction by shaping the user experience during system interaction, where ease of use, reliability, and efficiency enhance user comfort and performance. Meanwhile, information quality affects user satisfaction by ensuring that the outputs generated by the system are accurate, relevant, and useful for decision-making. In practice, both variables operate simultaneously in determining user satisfaction, as a system with strong technical performance will not satisfy users if the information provided is inaccurate, and conversely, high-quality information cannot compensate for a poorly designed system. Therefore, optimizing both system quality and information quality is essential to achieve higher levels of user satisfaction, forming the basis for the hypotheses proposed in this study.

H1: System quality has a positive and significant effect on user satisfaction with academic information systems.

H2: Information quality has a positive and significant effect on user satisfaction with academic information systems.

H3: System quality and information quality simultaneously have a positive and significant effect on user satisfaction with academic information systems.

3. METHODS

3.1 Research Design

This study employs a quantitative research approach to examine the effect of system quality and information quality on user satisfaction with Academic Information Systems (AIS) in Indonesia. A quantitative method is considered appropriate because this study aims to test hypotheses and measure the relationships between variables using statistical analysis. The research design is explanatory, as it seeks to explain causal relationships between independent variables (system quality and information quality) and the dependent variable (user satisfaction).

3.2 Population and Sample

The population of this study consists of users of Academic Information Systems (AIS) in higher education institutions in Indonesia, particularly students who actively interact with the system for academic purposes such as course registration, accessing grades, and viewing schedules. The sampling technique employed is purposive sampling, in which respondents are selected based on specific criteria, including being active users of the academic information system, having experience in using the system for at least one semester, and being willing to participate in the study. A total of 150 respondents were included as the sample, which is considered adequate for quantitative analysis using regression techniques and provides sufficient statistical power for hypothesis testing.

3.3 Data Collection Technique

Data were collected through a structured questionnaire distributed online to respondents, which was developed based on established indicators from previous studies and adapted to the context of academic information systems. All variables were measured using a Likert scale ranging from 1

(strongly disagree) to 5 (strongly agree), enabling the quantification of respondents' perceptions and facilitating subsequent statistical analysis [15].

3.4 Research Variables and Operational Definitions

This study involves three main variables, namely system quality (X1), information quality (X2), and user satisfaction (Y). System quality refers to the performance of the academic information system in terms of technical and functional aspects, measured through indicators such as ease of use, system reliability, response time, accessibility, and system flexibility. Information quality refers to the quality of information generated by the system, which is assessed based on accuracy, relevance, completeness, timeliness, and consistency. Meanwhile, user satisfaction reflects the level of user contentment with the academic information system, measured through indicators including overall satisfaction, perceived usefulness of the system, satisfaction with system performance, and the extent to which the system fulfills user needs.

3.5 Instrument Testing

Before conducting the main analysis, the research instrument was tested for validity and reliability to ensure the quality of the data. The validity test was carried out using the Pearson Product-Moment correlation method, where an item is considered valid if the correlation coefficient (r-value) exceeds the critical value (r-table) and has a significance level below 0.05. Meanwhile, reliability was assessed using Cronbach's Alpha, with a variable deemed reliable if the alpha value is greater than 0.70, indicating strong internal consistency among the measurement items.

3.6 Data Analysis Technique

Data analysis in this study was conducted using IBM SPSS Statistics version 25, comprising several stages including descriptive statistics, classical assumption tests, multiple linear regression analysis, and hypothesis testing [16]. Descriptive statistics were used to describe respondent characteristics and summarize responses for each variable, while classical assumption tests—consisting of normality, multicollinearity, and heteroscedasticity tests—were performed to ensure the validity of the regression model. Multiple linear regression analysis was applied to examine the effect of system quality (X_1) and information quality (X_2) on user satisfaction (Y), using the model $Y=\alpha+\beta1X1+\beta2X2+\varepsilon$, where α represents the constant, $\beta1$ and $\beta2$ are regression coefficients, and ε is the error term. Furthermore, hypothesis testing was conducted using the t-test to assess the partial effect of each independent variable, the F-test to evaluate their simultaneous effect, and the coefficient of determination (R^2) to measure the proportion of variance in user satisfaction explained by the independent variables.

4. RESULTS AND DISCUSSION

4.1 Respondent Characteristics

This study involved 150 respondents who actively use Academic Information Systems (AIS) in Indonesian universities.

Table 1. Respondent Characteristics

Criteria	Category	Frequency	Percentage (%)
Gender	Male	66	44.0
	Female	84	56.0
Education Level	Undergraduate	120	80.0
	Postgraduate	30	20.0
Usage Experience	< 1 year	42	28.0
	≥ 1 year	108	72.0
Frequency of Use	Occasionally	52	34.7
	Regularly	98	65.3

The respondent characteristics presented in Table 1 indicate that the sample is dominated by female participants (56.0%) compared to male participants (44.0%), suggesting a relatively balanced gender distribution with slight female predominance. In terms of education level, the majority of respondents are undergraduate students (80.0%), while postgraduate students account for only 20.0%, reflecting that AIS usage is more intensive among undergraduate populations. Regarding usage experience, most respondents (72.0%) have used the system for more than one year, indicating a high level of familiarity and experience in interacting with the system, which strengthens the reliability of their responses. Additionally, the frequency of use shows that 65.3% of respondents access the system regularly, while 34.7% use it occasionally, highlighting that AIS plays a significant and routine role in supporting academic activities. Overall, these characteristics suggest that the respondents are experienced and active users, making them well-suited to provide valid and insightful evaluations of system quality, information quality, and user satisfaction.

4.2 Descriptive Statistics

Descriptive statistics were used to measure respondents' perceptions of each variable.

Table 2. Descriptive Statistics

Variable	N	Min	Max	Mean	Std. Deviation
System Quality (X1)	150	2.80	4.80	3.96	0.52
Information Quality (X2)	150	3.00	4.90	4.08	0.48
User Satisfaction (Y)	150	2.90	4.85	4.02	0.50

The descriptive statistics in Table 2 indicate that respondents generally have positive perceptions of all variables examined in this study. Information quality (X2) records the highest mean value (4.08), followed by user satisfaction (Y) at 4.02 and system quality (X1) at 3.96, suggesting that respondents perceive the information generated by the system to be slightly better than the system's technical performance itself. The minimum and maximum values across variables show a relatively wide response range, indicating variability in user experiences, although the mean values remain consistently above 3.5, reflecting overall favorable evaluations. Furthermore, the standard deviation values, ranging from 0.48 to 0.52, indicate moderate data dispersion, suggesting that respondents' answers are relatively consistent without extreme variation. These findings imply that both system quality and information quality are perceived to be at a good level and are likely to contribute positively to user satisfaction within academic information systems.

4.3 Validity and Reliability Test

4.3.1 Validity Test

All questionnaire items were tested using Pearson correlation. The results show that all items have r-count values ranging from 0.512 to 0.821, which are greater than the r-table value (0.160). Therefore, all items are valid.

4.3.2 Reliability Test

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	Threshold	Result
System Quality	0.872	0.70	Reliable
Information Quality	0.889	0.70	Reliable
User Satisfaction	0.912	0.70	Reliable

The reliability test results presented in Table 3 indicate that all variables in this study demonstrate a high level of internal consistency, as evidenced by Cronbach's

Alpha values exceeding the threshold of 0.70. Specifically, user satisfaction shows the highest reliability (0.912), followed by information quality (0.889) and system quality (0.872), suggesting that the measurement items for each construct are highly consistent in capturing the intended concepts. These results confirm that the research instrument is reliable and suitable for further statistical analysis, as the responses provided by participants are stable and consistent across items within each variable.

4.4 Classical Assumption Tests

Table 4. Classical Assumption Test Results

Test Type	Indicator	Result	Conclusion
Normality	Sig. Kolmogorov-Smirnov	0.200	Normal
Multicollinearity	VIF (X1, X2)	1.456; 1.452	No Multicollinearity
Heteroscedasticity	Sig. (Glejser Test)	0.312; 0.278	No Heteroscedasticity

The classical assumption test results presented in Table 4 indicate that the data meet all the necessary requirements for conducting multiple linear regression analysis. The normality test, based on the Kolmogorov-Smirnov significance value of 0.200 (> 0.05), confirms that the data are normally distributed. Furthermore, the multicollinearity test shows VIF values of 1.456 and 1.452 for system quality and information quality, respectively, which are well below the threshold of 10, indicating that there is no multicollinearity between the independent variables. Additionally, the heteroscedasticity test using the Glejser method yields significance values of 0.312 and 0.278 (> 0.05), suggesting the absence of heteroscedasticity. Overall, these findings demonstrate that the regression model satisfies the classical assumptions, ensuring the validity and reliability of subsequent statistical analysis.

4.5 Multiple Linear Regression Analysis

Analysis was conducted using IBM SPSS Statistics version 25

Table 5. Regression Results

Variable	B	Std. Error	Beta	t-value	Sig.
Constant	1.184	0.321	—	3.687	0.000
System Quality (X1)	0.342	0.069	0.368	4.957	0.000
Information Quality (X2)	0.429	0.072	0.441	5.958	0.000

The regression results presented in Table 5 indicate that both system quality (X1) and information quality (X2) have a positive and significant effect on user satisfaction. The constant value of 1.184 suggests the baseline level of user satisfaction when the independent variables are held constant. System quality shows a regression coefficient of 0.342 with a t-value of 4.957 and a significance level of 0.000, indicating a positive and statistically significant influence on user satisfaction. Similarly, information quality exhibits a higher regression coefficient of 0.429 with a t-value of 5.958 and a significance value of 0.000, demonstrating a stronger positive and significant effect compared to system quality. The standardized beta values further confirm that information quality ($\beta = 0.441$) has a greater contribution than system quality ($\beta = 0.368$) in explaining variations in user satisfaction. Overall, these findings suggest that improvements in both system performance and the quality of information provided will lead to increased user satisfaction, with information quality playing a more dominant role.

4.6 Hypothesis Testing

4.6.1 t-Test

The results of the t-test indicate that both independent variables have a significant effect on user satisfaction. System quality (X1) shows a t-value of 4.957 with a significance level of 0.000, while information quality (X2) has a higher t-value of 5.958 with the same significance level of 0.000, both of which are below the threshold of 0.05. These findings confirm that system quality and information quality individually have a positive and statistically significant influence on user satisfaction.

4.6.2 F-Test

Table 6. ANOVA (F-Test)

Model	F-value	Sig.
Regression	72.613	0.000

The ANOVA (F-test) results in Table 6 indicate that the regression model is statistically significant, as evidenced by an F-value of 72.613 with a significance level of 0.000, which is well below the threshold of 0.05. This finding demonstrates that system quality and information quality simultaneously have a significant effect on user satisfaction, meaning that the independent variables collectively contribute to explaining variations in the dependent variable. The high F-value also suggests that the model has strong explanatory power, reinforcing the reliability of the regression analysis in capturing the relationship between the variables.

4.6.3 Coefficient of Determination

The model summary results show an R value of 0.695, indicating a strong relationship between the independent variables and user satisfaction, while the coefficient of determination (R^2) of 0.483 and adjusted R^2 of 0.476 suggest that 48.3% of the variation in user satisfaction can be explained by system quality and information quality, with the remaining 51.7% influenced by other factors not included in the model.

Discussion

The findings of this study provide strong empirical support for the significant role of system quality and information quality in shaping user satisfaction with Academic Information Systems (AIS), thereby reinforcing the explanatory power of the DeLone and McLean Information Systems Success Model within the context of higher education in developing countries. The positive and significant effect of system quality (β = 0.342) indicates that technical attributes such as ease of use, reliability, and responsiveness are fundamental in enhancing user experience. This suggests that users are more likely to be satisfied when the system operates efficiently, minimizes errors, and provides a seamless interaction environment. These findings are aligned with prior studies emphasizing that system usability and performance are critical determinants of perceived system effectiveness, particularly in environments where users interact with digital platforms on a routine basis [8], [10].

More importantly, the results reveal that information quality exerts a stronger influence on user satisfaction (β = 0.429), highlighting that users place greater emphasis on the accuracy, relevance, and timeliness of information generated by the system. In the context of AIS, where users depend on information for critical academic decisions—such as course registration, academic planning, and grade evaluation—the reliability of information becomes a central concern. This finding extends previous research by demonstrating that, in academic environments, the value of information output may outweigh technical system features, thereby positioning information quality as a dominant driver of satisfaction [11], [12].

Furthermore, the simultaneous significance of both variables ($F = 72.613$, $p <$

0.05) confirms that system quality and information quality operate in an integrated manner in influencing user satisfaction. This implies that improvements in only one dimension are insufficient to achieve optimal system performance; rather, a balanced enhancement of both technical functionality and informational output is required. A system with advanced technical capabilities but poor information quality will fail to meet user expectations, and conversely, high-quality information cannot compensate for a poorly designed system interface. This integrative perspective is consistent with the multidimensional nature of information system success as conceptualized in established theoretical models.

However, the coefficient of determination (R^2 = 0.483) indicates that approximately 48.3% of the variance in user satisfaction is explained by system quality and information quality, suggesting that other factors also contribute to shaping user perceptions. Variables such as service quality, user trust, perceived usefulness, system security, and overall user experience may play complementary roles in influencing satisfaction levels. This highlights the need for future research to adopt a more comprehensive model that incorporates additional constructs to better capture the complexity of AIS usage behavior.

From a practical perspective, these findings provide important implications for higher education institutions and system developers. Universities should prioritize continuous system improvement by enhancing both technical performance—such as system stability, speed, and usability—and the quality of information provided, including its accuracy, completeness, and timeliness. Strategic investments in these areas are likely to increase user satisfaction, promote sustained system usage, and ultimately improve institutional performance. In conclusion, this study not only confirms the critical importance of system quality and information quality but also underscores the need for a holistic approach in optimizing academic information systems to meet evolving user expectations in the digital era.

5. CONCLUSION

This study concludes that system quality and information quality play a significant role in determining user satisfaction with Academic Information Systems in Indonesia, as both variables are found to have a positive and significant effect, indicating that improvements in system performance and information output lead to higher levels of user satisfaction. Among the two, information quality demonstrates a stronger influence, suggesting that users place greater importance on the accuracy, relevance, and timeliness of the information provided. Furthermore, the simultaneous effect of system quality and information quality highlights the necessity of developing both aspects in an integrated manner, as a technically robust system with poor information quality, or vice versa, will not fully satisfy users. The coefficient of determination also indicates that additional factors beyond the variables examined may influence user satisfaction; therefore, future research is recommended to incorporate variables such as service quality, trust, and user experience to achieve a more comprehensive understanding. Overall, this study contributes to the information systems literature and offers practical insights for enhancing the effectiveness of academic information systems in higher education institutions.

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