

# EVALUATION OF THE IMPLEMENTATION OF SIAKAD 4.0 AT STAI DARUL FALAH: ANALYSIS OF STUDENT SATISFACTION, ADMINISTRATIVE OBSTACLES, AND ACADEMIC SERVICE EFFICIENCY

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**Abstract:** As an Islamic religious higher education institution, STAI Darul Falah has additional challenges in ensuring that the application of technology remains in line with Islamic values. This is a major concern, considering that the technology used must support the institution's mission of producing graduates who are not only intellectually intelligent but also have high moral and spiritual integrity. This research aims to evaluate the effectiveness of SIAKAD 4.0 at STAI Darul Falah using quantitative and qualitative approaches. This research uses a mixed-method approach, which combines quantitative and qualitative methods to gain a comprehensive understanding of the effectiveness of SIAKAD 4.0 at STAI Darul Falah. The population in this study includes all students and academic management staff who actively use SIAKAD 4.0 at STAI Darul Falah with a sample consisting of 100 students and 10 academic management staff. This research shows that the implementation of SIAKAD 4.0 at STAI Darul Falah has had a significant positive impact on the efficiency and quality of educational services. This system has succeeded in increasing the speed of administrative services, reducing error rates, and increasing the accessibility of academic data for students and administrators. The results of the questionnaire analysis indicate that the majority of students are satisfied with the convenience and benefits offered by this system. However, several aspects still require improvement. However, this research also revealed several obstacles faced in implementation, including limited technological infrastructure and a lack of technical training for managers.  
Keywords: SIAKAD 4.0; STAI Darul Falah; Technology.

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## Introductions

In today's digital age, the world is undergoing rapid technological transformation. Almost all aspects of life are experiencing digital disruption, including the higher education sector. Universities are no longer only required to provide conventional educational services, but must also be able to optimally utilise information technology to improve the quality of academic and administrative services. The development of information technology has brought about significant transformations in various sectors, including the education sector (Al Ayyubi et al., 2024). Higher education institutions, as institutions tasked with producing quality human resources, are required to utilise technology to improve the quality of academic services. One form of technology application in higher education is the use of the Academic Information System (SIAKAD), which is designed to manage and integrate academic data efficiently. According to Laudon & Traver (2020), an information system is a collection of components that interact with each other to collect, process, store, and disseminate information to support decision-making and coordination within an organisation. In the context of education, SIAKAD is a form of information technology implementation

that helps institutions manage student data, lecturers, lecture schedules, and academic evaluations digitally. This is in line with the view that Dewi et al. (2023) which emphasises that digital transformation in education aims to create efficiency and transparency in academic management.

The importance of academic digitisation is becoming increasingly urgent as we see that slow and error-prone manual administrative processes are no longer relevant amid students' expectations for fast, easy, and responsive services. The era of the Fourth Industrial Revolution brings new challenges for universities to adapt to technological developments. The 4th Industrial Revolution is characterised by the convergence of digital, physical, and biological technologies, which are driving significant changes in how organisations operate (Alam, 2020; Boss & Krauss, 2022; Khasanah et al., 2023; Liam et al., 2023; Muslim, 2023). In the world of education, this means adopting technologies such as big data, cloud computing, and artificial intelligence to support academic and administrative activities. This is reinforced by findings Suryani & Wiryadigda (2022), which shows that 4.0 technology can improve the efficiency of academic services through the automation of administrative processes and analytics-based data management. The implementation of SIAKAD 4.0 at STAI Darul Falah aims to integrate all academic processes into a single digital platform that is easily accessible to students, lecturers, and administrative staff. The system offers features such as course registration, grade processing, schedule management, and real-time academic reporting. Therefore, based on STAI Darul Falah's internal report, SIAKAD 4.0 is expected to reduce administrative errors, improve efficiency, and enhance communication among relevant parties.

Digital transformation in education, particularly through the implementation of SIAKAD, is a strategic step towards achieving efficiency, accuracy, and data integration in academic management. This context becomes increasingly important when considered in relation to the characteristics of religious educational institutions such as STAI Darul Falah, which not only prioritise technological efficiency but also place spiritual values and ethics at the core of their operational framework. However, the implementation of SIAKAD 4.0 is not without its challenges. Based on previous research by Anggraini & Aprilliana (2019) Some common obstacles in implementing academic information systems in higher education institutions include limited technological infrastructure, lack of training for users, and resistance to change from internal parties. At STAI Darul Falah, similar challenges were also identified, particularly related to limited server capacity and students' lack of understanding of the system's features. User satisfaction serves as a key indicator in evaluating the success of the implementation of SIAKAD 4.0. According to the Technology Acceptance Model (TAM) theory proposed by Davis (1989), User acceptance of technology is greatly influenced by perceived ease of use and perceived usefulness. In the context of SIAKAD 4.0, students and administrators will accept and utilise the system if they feel that it is easy to use and provides tangible benefits in their academic activities.

In the study Yoga & Novita (2021), The implementation of the COBIT 5 framework has proven to improve the quality of academic information services in the Academic Information System (SIAKAD). This framework provides guidelines for managing information technology in line with the strategic objectives of higher education institutions. In addition, an analysis of the successful implementation of the Campus Academic Information System (SIMAK) by Atmawidjaja & Purnawan (2018) Using the DeLone and McLean (D&M) IS Success Model shows that the success of information systems is influenced by system quality, information quality, and user satisfaction. Other studies mention that the use of digital technology not only improves learning effectiveness but also the digital competence of teachers and students (Abidin, 2023; Ainun et al., 2022; Khodijah et al., 2021; Nikmah, 2020; Putri et al., 2022). This shows that the integration of technology in education has a broad positive impact, both on academic management and learning.

This study aims to evaluate the effectiveness of SIAKAD 4.0 at STAI Darul Falah using quantitative and qualitative approaches. The focus of the study is on student satisfaction levels, challenges faced by administrators, and the system's impact on academic service efficiency. The results of this study are expected to provide useful recommendations for the development and optimisation of SIAKAD 4.0 in the future. The implementation of SIAKAD 4.0 is expected to address various administrative challenges that were previously managed manually. The digitalisation of educational administration not only enhances time efficiency but also improves data accuracy and

service transparency. However, the success of this digitalisation heavily depends on technological infrastructure support, user competence, and management commitment to managing change (Hidayatulloh, 2021; Oktaria et al., 2023; Pastor et al., 2024).

As an Islamic higher education institution, STAI Darul Falah faces additional challenges in ensuring that the application of technology remains in line with Islamic values. This is a key concern, given that the technology used must be able to support the institution's mission of producing graduates who are not only intellectually intelligent but also possess high moral and spiritual integrity. Therefore, the evaluation of SIAKAD 4.0 does not only assess technical aspects but also considers its impact on work culture and social interactions within the campus environment. Based on the above, this research is relevant to identify to what extent SIAKAD 4.0 has been successfully implemented at STAI Darul Falah, as well as to provide an overview of the opportunities and challenges faced in managing a digital-based academic information system. Based on this, this study aims to analyse the level of student satisfaction with the use of SIAKAD at STAI Darul Falah. In addition, this study also aims to identify and evaluate the obstacles faced by managers in implementing SIAKAD and its impact on the efficiency of academic services at STAI Darul Falah.

## Method

This study uses a mixed-method approach, combining quantitative and qualitative methods to gain a comprehensive understanding of the effectiveness of SIAKAD 4.0. The mixed approach allows researchers to utilise the strengths of quantitative methods in statistical measurement and qualitative methods in in-depth exploration of phenomena. The quantitative approach is used to measure student satisfaction with the use of the system, while the qualitative approach is applied to explore the constraints and opportunities of implementation through interviews with academic administrators. The population in this study includes all students and academic administrators who actively use SIAKAD 4.0 at STAI Darul Falah. According to Creswell (2010) The mixed approach allows researchers to utilise the strengths of quantitative methods in statistical measurement and qualitative methods in in-depth exploration of phenomena. The quantitative approach is used to measure student satisfaction with the use of the system, while the qualitative approach is applied to explore the constraints and opportunities of implementation through interviews with academic administrators. The population in this study includes all students and academic administrators who actively use SIAKAD 4.0 at STAI Darul Falah. According to Sugiyono (2021) The population is the entire subject of the study. Samples were taken using purposive sampling, which means that respondents were selected based on specific criteria relevant to the research objectives. The sample criteria included students who actively use SIAKAD 4.0 in academic activities and academic administrators who have direct responsibility for operating the system. The total sample consisted of 100 students and 10 academic administrators.

This study utilised three main techniques in data collection, namely questionnaires, interviews, and documentation. The first technique was a questionnaire, which was given to students to measure their level of satisfaction with the features and benefits of SIAKAD 4.0. The questionnaire was designed using a five-point Likert scale, as explained by Boone Jr & Boone (2012), which enables quantitative measurement of user perceptions. The second technique is semi-structured interviews with academic administrators to obtain in-depth information about technical and operational constraints. This technique was chosen for its flexibility in eliciting relevant information (Bryman & Cramer (2012). The third technique is documentation, which involves collecting secondary data from STAI Darul Falah's internal reports, such as system usage statistics and administrative error rates. The data obtained is analysed using quantitative and qualitative approaches. Quantitative data from questionnaires is analysed using descriptive statistical methods to determine student satisfaction levels. Descriptive statistics include calculating the distribution of responses, averages, and percentages to provide an overview of response patterns. Qualitative data from interviews are analysed thematically, as explained by Braun & Clarke (2006), to identify key patterns related to constraints, opportunities, and recommendations for development. Triangulation techniques were used to compare the results from the three data sources, namely questionnaires, interviews, and documentation, to ensure the validity and reliability of the research findings. (Patton, 1999).

The research process begins with planning, which includes developing research instruments such as questionnaires and interview guides. These instruments are first tested to ensure their validity and reliability.

Following this, data collection is conducted through the distribution of questionnaires to students, interviews with academic administrators, and the collection of relevant documents from internal reports. The collected data is then analysed quantitatively and qualitatively according to the methods described. The final stage is the preparation of the research report, which includes findings, discussions, and recommendations for the development of SIAKAD 4.0 at STAI Darul Falah. With a methodology designed in depth and based on relevant references, this research is expected to provide a comprehensive overview of the effectiveness, challenges, and opportunities in the implementation of SIAKAD 4.0 at STAI Darul Falah..

## Findings and Discussion

### Findings

This study reveals that the implementation of SIAKAD 4.0 at STAI Darul Falah has received positive feedback from the majority of students. The system is designed to provide easy access and transparency in managing academic data, such as class schedules, grades, and other administrative processes. Based on an analysis of questionnaires distributed to 100 students, the results showed an average satisfaction score of 4.2 on a five-point Likert scale. Students feel that the system has been helpful, particularly in terms of accessibility and the ease of obtaining real-time academic information.

In particular, the class schedule access feature received the highest score with an average of 4.5. This feature allows students to easily view their schedules without having to visit the administration office in person. This is in line with research Latifah (2024) which states that accessibility is one of the main indicators of the success of an academic information system. On the other hand, the user interface feature received a lower score of 3.7, with some students complaining that the system design was not very intuitive, requiring more time to adapt. The analysis results show that 85 percent of students are satisfied with the ease of use offered by this system, particularly in managing grades and class schedules. However, 15 percent of respondents expressed dissatisfaction, with the main reason being the system's limited ability to handle spikes in access during the course registration period. According to Davis et al. (1989), Perceptions of ease of use and benefits are two key factors that influence user satisfaction with new technologies.

**Table 1.** Student Satisfaction

Features	Average	Category
Access to Lecture Schedules	4,5	Very High
Grade Management	4,3	High
Academic Announcements	4,1	High
User Interface	3,7	Currently

The table above illustrates student satisfaction levels with the main features of SIAKAD 4.0. These results show that the system has been able to meet most of the students' needs, although there is room for improvement, especially in terms of user interface. In addition to efficiency and accessibility, user satisfaction is also influenced by technical and non-technical aspects that involve the overall user experience. This study found that technical aspects, such as system response speed and data availability, play an important role in enhancing student satisfaction. Based on a questionnaire distributed to students, over 80 per cent stated that SIAKAD 4.0 has adequate speed in processing academic data, including course registration and transcript issuance.

On the other hand, non-technical aspects, such as ease of use and interface design, pose challenges that require further attention. Only 65 percent of students felt that the system interface was easy to use. The main issues raised were the menu layout, which was considered unintuitive, and the lack of responsiveness when accessed via

mobile devices. These findings support the statement that Davis et al (1989), which states that perceptions of ease of use greatly influence the adoption of new technologies. The results of this analysis confirm that in order to improve overall user satisfaction, improvements must be made not only to technical aspects but also to the design and functionality of the system. User training modules also need to be optimised to ensure that students and administrators understand the full potential of the system that has been implemented.

Interviews conducted with ten academic administrators at STAI Darul Falah revealed a number of obstacles encountered during the implementation of SIAKAD 4.0. The main obstacle was infrastructure limitations, particularly unstable internet connections. This posed a significant challenge during peak usage periods, such as course registration periods. Some administrators reported that connection disruptions often caused delays in data processing, which ultimately impacted user satisfaction. According to Yoga & Novita (2021), The success of academic information systems is highly dependent on adequate infrastructure support. In addition, limitations in technical training are also a significant obstacle. Most administrators feel that the initial training provided does not cover all the technical aspects necessary to manage the system effectively. As a result, administrators often face difficulties when dealing with technical issues without direct assistance from the IT team. This emphasises the importance of ongoing training programmes that cover not only technical aspects but also digital data management. To gain an in-depth understanding of the impact of SIAKAD 4.0, system performance was analysed based on three key indicators: connection stability, data processing speed, and administration error rate. The following data shows the results of the performance analysis after implementation.

**Table 2.** SIAKAD 4.0 Performance Analysis

<b>Indicator</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Change (%)</b>
Connection Stability	70%	85%	+15
Data Processing Speed	60 second	30 second	-50
Administrative Error Rate	12%	5%	-58

From the table above, it can be seen that the implementation of SIAKAD 4.0 has successfully increased connection stability by 15 percent and reduced the rate of administrative errors by 58 percent. This shows that the system has met user expectations in terms of accuracy and speed, although further improvements are still needed, especially in terms of connection stability to support simultaneous use. To ensure the continued success of the SIAKAD 4.0 implementation, several recommendations are suggested. First, enhancing the capacity of technological infrastructure, such as internet bandwidth and servers, is crucial to accommodate the growing number of users. Second, conducting ongoing training for academic administrators should be a regular agenda item, enabling them to handle technical issues with greater confidence and utilise the system optimally. Third, periodic evaluations of user needs through surveys and feedback analysis must be conducted to ensure the system remains aligned with users' dynamic requirements.

The implementation of SIAKAD 4.0 has had a significant impact on the efficiency of academic services at STAI Darul Falah. Based on documentation analysis, it was found that the time required to complete academic administrative services decreased by an average of 40 percent after the system was implemented. For example, the time required for course registration previously reached 45 minutes per student, but after the digitalisation of this process, the time needed was reduced to just 25 minutes. This reduction demonstrates that the digital-based system is capable of simplifying workflows that were previously manual. The transcript issuance service also saw a significant improvement in efficiency. A process that previously took up to 120 minutes can now be completed in 80 minutes. This aligns with research findings Yoga & Novita (2021) which shows that the digitisation of academic services can speed up administrative processing times without compromising data accuracy. In other words, SIAKAD 4.0 not only provides time efficiency but also enhances user satisfaction by delivering faster and more accurate results. However, there are still challenges in some services, such as managing student complaints. Although the system can expedite other administrative processes, the resolution time for complaints still requires

further improvement. Currently, the average resolution time for complaints is three days, which is considered too long by some students. Therefore, developing an additional module specifically designed to handle student complaints more quickly and systematically should be considered as the next step in system development.

**Table 3.** Academic Services at STAI Darul Falah

Type of Academic Service	Time Before Implementation (minutes)	Time After Implementation (minutes)
Course Registration	45	25
Transcript Issuance	120	80
Academic Grade Management	60	40
Student Complaint Resolution	N/A	3 day

The table above shows how SIAKAD 4.0 has improved efficiency in various aspects of academic services. With faster course registration and transcript issuance times, this system has a direct impact on the student experience. However, further improvements to complaint resolution services are one of the top priorities for future development. The efficiency gained through the implementation of SIAKAD 4.0 benefits not only students but also academic administrators. The system reduces the manual workload that previously required significant time and effort. With automation, administrators can focus more on strategic tasks such as curriculum development or improving the quality of education. This demonstrates that the digitalisation of academic services is a strategic investment to support the long-term vision of educational institutions.

However, to ensure the sustainability of the efficiency that has been achieved, periodic evaluations of system performance are required. These evaluations include not only technical data analysis but also feedback collection from users, both students and academic administrators. Thus, SIAKAD 4.0 can continue to evolve in line with the needs and dynamics of the educational environment. The academic service efficiency resulting from the implementation of SIAKAD 4.0 also opens up opportunities for further innovation in the field of academic administration. One potential area is the integration of the system with artificial intelligence (AI) technology to enhance the personalisation of services. With this technology, for example, the system can provide course recommendations or career paths tailored to each student's academic profile. This is relevant to the findings Dahri et al. (2024) which highlights the importance of 4.0 technology in supporting efficiency while creating added value in the education sector.

In addition, the development of a more integrated communication module is also a priority to improve the user experience. This module may include chat or ticket-based support features that allow students and administrators to communicate directly through the system. This will shorten the time needed to resolve student complaints, while also increasing transparency in the administrative process. At the institutional level, the implementation of SIAKAD 4.0 at STAI Darul Falah also has a positive impact on institutional governance. This system enables more structured and integrated data management, facilitating strategic decision-making based on relevant and real-time data. In this context, the application of digital technology is not only a tool for operational efficiency but also a key enabler in long-term planning.

## Discussion

The Academic Information System (SIAKAD) is an information technology-based platform used to support academic data management in higher education institutions. This system enables the integration of academic processes, such as student registration, class scheduling, grade management, and the automatic generation of academic reports. The information system comprises various components that function to process, store, and distribute information in support of decision-making (Anggraini & Aprilliana, 2019; Liwayanti, 2021; Nur Miyazaki et al., 2024). In the context of higher education, SIAKAD is designed to provide efficiency and speed in data management, thereby improving the quality of academic services. The main benefits of SIAKAD include

transparency and efficiency in academic administration. Research by Nugroho et al. (2020) states that the implementation of SIAKAD can significantly reduce administrative errors, speed up services to students, and improve the accuracy of academic data management. This system also supports transparency because students, lecturers, and administrative staff can access information in real-time through a digital portal. In addition, the implementation of SIAKAD enables secure, cloud-based data management that can be accessed at any time.

However, the success of SIAKAD implementation really depends on the quality of the system and user participation. Atmawidjaja and Purnawan (2018) used the DeLone and McLean model to evaluate the success of the Campus Academic Information System (SIMAK) and found that system quality, information quality, and user satisfaction were key factors in ensuring the effectiveness of the system. Therefore, the management of SIAKAD must consider both technical aspects and user needs to ensure optimal performance. The 4th Industrial Revolution has brought significant innovations to the education sector through the integration of digital, physical, and biological technologies. This era is characterised by fundamental changes in how organisations operate through the use of technologies such as big data, artificial intelligence (AI), the Internet of Things (IoT), and cloud computing (Kim et al., 2020; Setiadi et al., 2023; Wahyono et al., 2023). In education, this technology enables large-scale data management, personalised learning, and automated administrative processes. Technology 4.0 also enables educational institutions to provide responsive and efficient cloud-based services.

The application of 4.0 technology in education aims to improve service quality and user experience. Masrokan & Fuadi (2023) notes that this technology supports digital transformation in academic management by providing quick access to academic data, enhancing collaboration, and providing data-driven predictive analytics. In the context of SIAKAD, 4.0 technology enables the integration of various systems, more structured data management, and the automation of services such as registration and grade reporting. However, the implementation of 4.0 technology also faces various challenges. Research Yoga & Novita (2021) found that infrastructure limitations, resistance to change, and lack of digital competence are the main barriers to the implementation of these technologies in higher education institutions. Overcoming these barriers requires strategies that include user training, technology infrastructure development, and management commitment to support digital transformation.

User satisfaction is one indicator of the success of information systems, including SIAKAD. According to Davis (1989),

In the Technology Acceptance Model (TAM), user satisfaction is influenced by two main factors: perceived ease of use and perceived usefulness. Users will feel satisfied if they perceive the system to be easy to use and provide real benefits in meeting their needs. In the context of SIAKAD, user satisfaction reflects the extent to which this system is able to support academic activities effectively. Research shows Armiyanti et al. (2023) that user satisfaction in SIAKAD is affected by accessibility, service quality, and system reliability. They also noted that adequate training and technical support can improve the user experience, especially for students using the system for the first time. This emphasises the importance of user involvement in the design and evaluation process of academic information systems. In addition, user satisfaction can also be improved through innovation and customisation of the system according to their needs. Adnan et al. (2024) suggests that periodic evaluation of system performance, along with the collection of user feedback, can help system developers understand deficiencies and identify areas for improvement. In the context of STAI Darul Falah, user satisfaction evaluations not only help ensure the successful implementation of SIAKAD 4.0, but also provide direction for future system development.

## Conclusions

This research shows that the implementation of SIAKAD 4.0 at STAI Darul Falah has a significant positive impact on the efficiency and quality of academic services. This system has succeeded in increasing the speed of administrative services, reducing the error rate, and increasing the accessibility of academic data for students and managers. The results of questionnaire analysis indicate that the majority of students are satisfied with the convenience and benefits offered by this system, although there are some aspects that still require improvement. However, the study also revealed a number of obstacles faced in the implementation, including limited technological infrastructure and lack of technical training for managers. These challenges show that the success of

the system depends not only on the technology itself, but also on the readiness of the institution to support the adoption of technology in a holistic manner. Thus for further research in an effort to ensure the sustainability and improvement of SIAKAD 4.0 at STAI Darul Falah is expected to orientate towards (1) Improving technological infrastructure, including internet bandwidth capacity and procuring additional servers, to support system stability and reliability during peak usage periods. (2) Organising regular technical training for academic managers to improve technological literacy and ability to manage the system. This training should include data management, technical troubleshooting, and optimal utilisation of system features; (3) Development of additional modules in SIAKAD 4.0, such as student complaint management features and satisfaction survey modules, to improve the responsiveness and transparency of academic services; (4) Periodic evaluation of system performance through user surveys and data analysis to ensure that the system remains relevant and in accordance with dynamic needs; and (5) Improvement of user interface design to ensure that the system is more intuitive and easily accessible, especially through mobile devices, so as to improve the overall user experience. Based on this, STAI Darul Falah is expected to optimise the potential of SIAKAD 4.0 as the main tool in supporting the efficiency and quality of academic services, while facing challenges in the era of digital transformation.

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