SIAKAD Revitalization: The Latest Solution in Answering the Challenges of Digitizing Education

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Abstract: The use of SIAKAD in academic management at tertiary institutions has been investigated in previous research. While it has been shown to provide significant benefits in improving the efficiency and effectiveness of academic administration, there are still some challenges that need to be addressed, such as technical issues, lack of management support, and the need for training and technical support for SIAKAD users. Therefore, efforts are needed to improve adequate management and technological support in the development and implementation of SIAKAD in higher education institutions. In this article, the importance of revitalizing SIAKAD in facing the challenges of digitizing education is discussed. The current SIAKAD is not enough to face these challenges, so the revitalization of SIAKAD is necessary to accommodate user needs in the digital era. The latest solutions that can be implemented in the revitalization of SIAKAD are also described. These solutions include the use of cloud technology, artificial intelligence, and big data analytics, as well as integration with other systems such as e-learning and mobile apps. Through the revitalization of SIAKAD, higher education institutions can better respond to the challenges of digitizing education. A more effective and efficient SIAKAD can make the academic administration process easier and faster. Moreover, it can also improve the quality of academic services provided to students and lecturers. The article concludes by highlighting the importance of collaborative discussion and action between the management of higher education institutions, lecturers, and staff to improve the benefits of SIAKAD in academic administration and overall academic service quality in higher education institutions.

Keywords: SIAKAD; College; Academic Administration; Revitalization; Digital Technology.

1. Introduction

The Academic Information System (SIAKAD) is a very important application in academic management in higher education. SIAKAD makes it easy for students and lecturers to carry out academic administration, such as registering courses, filling out KRS, scheduling lectures, and managing grades. In addition, SIAKAD also makes it easier for universities to collect academic data needed for reporting and evaluation. In today's digital era, digitizing education is growing and is becoming a very important need. The challenge of digitizing education is forcing universities to develop SIAKAD to be more effective and efficient. The current SIAKAD still has deficiencies in facing the challenges of digitizing education. Therefore, SIAKAD revitalization is needed to accommodate the needs of users in the digital era. SIAKAD revitalization is carried out by implementing the latest solutions, such as the use of cloud technology, artificial intelligence, and big data analytics. In addition, integration of SIAKAD with other systems such as e-learning and mobile apps is also one of the latest solutions to increase the effectiveness of SIAKAD. Through the revitalization of SIAKAD, higher education institutions can better respond to the challenges of digitizing education, to improve the quality of academic services provided to students and lecturers. In this article, we will discuss the importance of revitalizing SIAKAD in facing the challenges of digitizing education, as well as the latest solutions that can be implemented in revitalizing SIAKAD. It is hoped that this article can provide useful information for readers regarding the importance of developing SIAKAD in today's digital era.

In this article, we will also discuss the advantages and benefits that can be obtained by revitalizing SIAKAD, such as increasing the efficiency and effectiveness of academic administration, improving the quality of academic services, and facilitating access to academic data for students, lecturers, and other related parties. Apart from that, this article also discusses the challenges and obstacles that may arise in revitalizing SIAKAD, and how to overcome these challenges. SIAKAD revitalization is an important solution in responding to the challenges of digitizing education in the current

digital era. Therefore, tertiary institutions must pay attention to and prioritize the development of SIAKAD so that they can provide quality academic services and meet the needs of users in the digital era.

In recent years, many studies have been conducted to develop web-based academic information systems. This system is very important because it is able to facilitate education administrators in managing academic data and information. Some of these studies produced quite interesting results and were successfully implemented in several educational institutions. One of the interesting studies to review is research from Firma Sahrul, Safi'ie, and WA (2016) regarding the implementation of a web-based academic information system using the Laravel framework. This study shows that the use of the Laravel framework can facilitate the process of developing a web-based academic information system. This framework has features that make development easier, such as routing, migration, and Eloquent ORM. In addition, the use of this framework can also minimize errors in writing program code, so that the system becomes more effective and efficient [1]. Research from Prihandoyo, M.T. (2018) also showed interesting results in the development of a web-based academic information system. This study uses the Unified Modeling Language (UML) Model for the development of academic information systems. The results of this study indicate that the use of the UML Model can facilitate the process of developing academic information systems and improve the quality of the resulting systems [2]. Furthermore, Ismail, Harmisal, and Jumaidin (2018) also developed a cloud-based academic information system at the Banda Aceh Mandiri Pharmacy Academy. This research shows that the use of cloud computing can facilitate the process of developing academic information systems because the use of cloud servers can increase storage capacity and speed up data access [3].

In addition, Kesuma, and Kholifah (2019) developed a web-based academic information system at LKP Rejeki Cilacap. This study shows that the developed academic information system can facilitate the management of academic data and management of class schedules [4]. Furthermore, Ariyanti, Satria, and Alita (2020) developed an academic and administrative information system using the Extreme Programming method at Course and Training Institutions. This study shows that the use of the Extreme Programming method can speed up the process of developing academic information systems and improve the quality of the resulting system [5]. Furthermore, Ayunandita, N., and Riskiono, S.D. (2021) developed an academic information system model using Extreme Programming at Madrasah Aliyah (MA) Mambaul Ulum Tanggamus. This study shows that the use of Extreme Programming can speed up the process of developing academic information systems and improve the quality of the resulting system [6]. Saputra, Sucipto, and Andriyanto (2022) conducted an analysis of the quality of the academic information system website at Nusantara PGRI Kediri University. This study aims to evaluate the quality of academic information system websites and provide recommendations to improve their quality [7]. Syahputra, Sunaryo, and Hanifa (2023) developed an academic information system for SDN 19 Pasar Ambacang based on PHP and database. This study aims to assist academic management in elementary schools using web and database technologies [8]. Pongmakamba, and Tambotoh (2023) evaluates the Satya Wacana academic information system by applying the model for mandatory use of software technologies. This study aims to evaluate the quality and effectiveness of the use of information systems [9].

Information and communication technology (ICT)-based academic information systems have become a necessity in managing academic data and information in tertiary institutions. According to Indrayani (2011), the use of ICT-based academic information systems can increase the efficiency and effectiveness of academic data management. In her research, Indrayani stated that the use of an academic information system can facilitate student data management, class schedule management, and other academic data management. This makes the administrative process in tertiary institutions faster, easier, and more accurate [10]. However, to achieve optimal efficiency and effectiveness, academic information systems need to be well designed and pay attention to user experience. This is in accordance with the research of Nisah and Ajie (2021) which emphasizes the importance of designing a user experience-based academic information system so that it is easy to use and minimizes errors in its use [11].

The effectiveness of academic information systems can also be seen from Danella's research (2012) which analyzed the effectiveness of academic information systems at Surabaya State University. In his research, Danella found that the use of academic information systems can increase the accuracy and speed of managing academic data. In addition, academic information systems also facilitate access to information for students and lecturers [12]. However, the effectiveness of using an academic information system also depends on user acceptance of the system. A case study conducted by Negara and Savitri (2019) shows that user acceptance of an academic information system is strongly influenced by factors such as the quality of the information presented, ease of use, and trust in the system [13]. On the other hand, the implementation of an android-based academic information system can also increase the effectiveness of managing academic data in schools. Research conducted by Sylfania, Juniawan, and Agusti (2019) shows that the use of an android-based academic information system at SMA Negeri 1 Tempilang can facilitate the management of class schedules and input of grades by teachers, as well as facilitate access to information for parents of students [14]. From some of these studies, the use of academic information systems can improve efficiency and effectiveness in managing academic data. However, it is important to pay attention to good system design and pay attention to user experience and user acceptance factors to achieve optimal effectiveness.

Several studies have been conducted to analyze the quality of Academic Information System (AIS) services and their impact on user satisfaction. Research by Septiani *et al.* (2020) used the Sevqual method at Abdurrab University SIA and found that there is a need to improve service quality in several aspects [15]. Another study by Nada and Wibowo (2015)

measured the quality of SIA services using the Webqual 4.0 method and found that navigational aspects had the greatest influence on user satisfaction. Another study by Utomo *et al*. (2017) showed that system quality, information quality, and service quality significantly influence SIA user satisfaction at Merdeka University Malang [16]. Meanwhile, research by Vivi Sahfitri and Evi Yulianingsih (2015) used the Kano method to evaluate the quality of SIA services and found that responsiveness and reliability aspects were top priorities in increasing user satisfaction [17]. Further research by Yindrizal (2021) discusses the impact of using SIA on improving the quality of academic services at Andalas University, Padang. The results show that the use of SIA has a positive impact on the quality of academic services [19]. Meanwhile, research by Zakiyyah (2019) used the Webqual 4.0 method and found that the quality of SIA services has a significant influence on user satisfaction, especially on the reliability and quality aspects of information [20]. Overall, these studies show that the quality of SIA services influences user satisfaction. Several aspects that need to be improved include navigation, responsiveness, reliability, and quality of information. The use of SIA can also help improve the overall quality of academic services.

SIAKAD Revitalization: The Latest Solution to the Challenges of Digitalizing Education and the novelty of this research is very important in facing the challenges of digitizing education. Several studies have been conducted in recent years to develop a web-based academic information system, which has become very important to facilitate education administrators in managing academic data and information. Information and communication technology (ICT)-based academic information systems have become a necessity in managing academic data and information in tertiary institutions. Revitalization of SIAKAD or Academic Information System is the latest solution in responding to the challenges of digitizing education and the latest research needs. SIAKAD revitalization is important because this system can help simplify academic administration processes and increase efficiency in data processing, thereby facilitating quick and accurate decision making. In an era of rapidly growing digitalization, academic information systems are very important. With this system, data can be accessed easily and quickly by all interested parties such as lecturers, students, and administrative staff. In addition, SIAKAD Revitalization can also enable integration between academic information systems and other systems such as payment systems, libraries, and other information systems. SIAKAD revitalization is also important in improving the quality of education and research. In an academic information system, data can be well integrated and available online, making it easier to access and process data for research needs. In this case, this system enables data collection that is more accurate, systematic, and easy to process. By utilizing SIAKAD Revitalization, universities and educational institutions can focus more on developing the quality of education and research, while administrative processes and data processing can be carried out more efficiently. In the long term, this will help improve the quality of education and research conducted by universities and educational institutions, as well as facilitate access and processing of data for the wider community.

2. Research Method

The research method used in this research is a quantitative approach with data collection techniques using a questionnaire. This quantitative approach aims to collect and analyze data numerically and statistically. In this method, researchers use questionnaires as a tool to collect data from respondents. The stages of the research consisted of identifying problems, determining research objectives, reviewing literature, designing questionnaires, collecting data, analyzing data, and compiling research reports. At the problem identification stage, researchers conducted observations and interviews to identify the problems to be studied. Observations were made to observe and collect data directly from the object of research, while interviews were conducted to obtain information from people related to the problem to be studied. Then, the researcher determines specific and clear research objectives and conducts a literature review to gather information related to the research topic. This literature review includes literature studies, journals, and publications related to the research topic. After that, the researcher designed a questionnaire as a data collection tool with questions appropriate to the research objectives. Questionnaires must be tested first to ensure that the questions asked can produce valid and reliable data. Then, the researcher collected data by sending questionnaires to respondents who had been randomly selected from the population that matched the inclusion criteria. The data that has been collected is then analyzed using statistical techniques and presented in the form of tables and graphs. Finally, the research results are summarized in the form of a research report. The research report must contain information about the problem under study, research objectives, results of data analysis, conclusions, and suggestions given based on the results of the research that has been done.

Figure 1. Research Stages

In this study, the objects studied were 40 public and private universities in Indonesia. To identify the problems to be studied, the researchers conducted observations and interviews. Observations were made by observing and collecting data directly from the object of research, namely the university which is the object of research. In addition, the researcher also conducted interviews with parties related to the problem to be studied, such as lecturers, students, and higher education administration staff who were selected as respondents in this study. From the results of observations and interviews, researchers will identify the problems that are the focus of this research. At the stage of determining research objectives, researchers must determine specific and clear objectives related to the problems that have been identified previously. Research objectives must be well formulated so that they can assist researchers in designing questions on the questionnaire and conducting proper data analysis. Next, the researcher conducted a literature review to collect information related to the research topic. This literature review includes literature studies, journals, and publications related to the research topic. Researchers must choose quality sources of information that are relevant to the research topic being studied. In conducting a literature review, researchers can collect information about developments in information and communication technology in the field of education, challenges to digitalization of education, as well as the latest solutions that can be applied to overcome these challenges. The information obtained from the literature review can assist the researcher in designing the questionnaire and gaining a better understanding of the research topic being studied.

After determining the research objectives and conducting a literature review, the researcher designed a questionnaire as a tool for collecting data. Questionnaires are made with relevant questions and in accordance with predetermined research objectives. The questions in the questionnaire must be designed in such a way as to produce valid and reliable data. Before the questionnaire was distributed to the respondents, the researcher conducted a pilot test to ensure that the questions in the questionnaire were well understood by the respondents and did not cause confusion or misunderstanding. In addition, researchers also conducted validity and reliability tests to ensure that the questionnaire could actually measure the variables they wanted to study accurately and consistently. After the questionnaire was designed and tested, the researcher then distributed the questionnaire to respondents who had been randomly selected from the population that matched the inclusion criteria. This data collection process was carried out carefully and carefully to ensure that the data obtained truly represents the population under study.

The questionnaire consisted of questions about demographic data (e.g. age, gender, education, occupation), questions about current use of academic information systems (e.g. frequency of use, ease of use, system reliability, etc.), questions about user desires and preferences to improve academic information systems (eg new features desired, types of additional services expected, etc.), questions about user perceptions of the importance of academic information systems in supporting their academic activities (eg how important the system is academic information in academic decision making, scheduling, etc.), questions related to the level of user satisfaction with the current academic information system (eg, how satisfied are they with the current system, how often do they experience difficulties when using it, etc.), and Questions related to user responses to changes that have been or will be made to the academic information system (eg, how agree are they with the changes, how ready are they to adapt to the changes, etc.).

After the questionnaire design process was completed, the researcher collected data by sending questionnaires to respondents who had been randomly selected from the population that matched the inclusion criteria. The population in this study were all public and private universities in Indonesia that have SIAKAD, as well as lecturers, academics and students who are involved in using SIAKAD. The researcher selected the sample using a purposive sampling method, namely selecting a specific sample based on certain predetermined criteria. Respondents were selected based on inclusion criteria such as active SIAKAD users, lecturers, academics, and students. After the data was collected, the researcher

analyzed the data using statistical techniques such as validity and reliability tests. Then, the data is presented in the form of tables and graphs to facilitate the interpretation of research results. From the results of data analysis, researchers can draw conclusions and provide suggestions for revitalizing SIAKAD to solve the challenges of digitalization of education. One of the statistical techniques that can be used is the validity and reliability test. The validity test aims to measure the extent to which the questionnaire used in this study can measure the variables you want to examine precisely. There are several ways to test validity, including content validity, construct validity, and criterion validity. Meanwhile, the reliability test aims to measure how consistent or stable the questionnaire is in measuring the variable to be studied. There are several ways to perform reliability tests, including internal consistency reliability tests, test-retest reliability tests, and split-half reliability tests. After the validity and reliability tests have been carried out, the researcher can ensure that the questionnaire used in this study can produce valid and reliable data. This will increase confidence in the resulting research results and can be used as a basis for making decisions and providing recommendations. The results of this study are also expected to provide useful input and information for decision makers in tertiary institutions in increasing the use of SIAKAD. Here are some formulas that are often used in testing the validity and reliability:

Construct validity:
1)   Product moment correlation: $r = (\Sigma Zx.Zy) / N$
2)   Alpha Cronbach: $\alpha = (N / (N - 1)) \times (1 - (\sum s^2 / Sxt^2))$

Uji retest:
1)   Product moment correlation: $r = (\Sigma XY / N) / (SX . SY)$
2)   Standard error of measurement: $SEM = SD \sqrt{(1-r)}$

Internal reliability test:
1)   Alpha Cronbach: $\alpha = (N / (N - 1)) \times (1 - (\sum s^2 / Sxt^2))$

Information:
N   = Total respondents
Zx   = Respondent's score on variable X which has been normalized
Zy   = Respondent's score on variable y which has been normalized
Σ = Total number
S^2 = The variance of the respondent's score on each item
Sxt^2 = Variance of respondents' scores on all items

After the data has been collected and analyzed, the next step is to prepare a research report. The research report must contain sufficient and clear information about the problem under study, research objectives, methods used, results of data analysis, conclusions, and suggestions given based on the results of the research that has been done. The initial part of a research report usually contains an introduction explaining the background of the problem, research objectives, and the theoretical framework used in the research. After that, the research methods used, such as research design, population and sample, data collection techniques, and data analysis techniques were explained. The next section is the results of research that presents data and data analysis that has been done. The data is presented in the form of tables, graphs or diagrams to make it easier to understand. Data analysis usually includes data validity and reliability tests, normality tests, hypothesis tests, and regression tests. Then, the results of data analysis are interpreted and explained in the form of conclusions that include answers to the problems studied. The conclusion can be presented in the form of a separate statement or combined with the discussion. Finally, the researcher provides suggestions based on the results of the research that has been done. These suggestions can be related to further research development or practical application of research results.

3. Result and Discussion

3.1 Results

The results of the study show that the use of the Academic Information System (SIAKAD) in tertiary institutions provides many benefits for students, lecturers, and other related parties. One of the significant benefits is the increased efficiency and effectiveness of academic administration. This is evident from 85% of respondents who stated that SIAKAD can speed up administrative processes and reduce errors in processing academic data. In addition, the use of SIAKAD also facilitates access to academic data for students, lecturers, and other related parties. As many as 75% of respondents stated that SIAKAD makes it easy to access the necessary academic data, such as class schedules, grades, and academic transcripts. The use of SIAKAD can also improve the quality of academic services provided by tertiary institutions. However, there are several obstacles encountered in using SIAKAD in tertiary institutions. These obstacles include technical problems, communication problems, and lack of support from university management. As many as 65% of respondents experienced technical problems when using SIAKAD, such as system slowness or errors in displaying

data. In addition, as many as 40% of respondents experienced communication problems with related parties in using SIAKAD. Lack of support from university management is also an obstacle, such as a lack of budget for the development of SIAKAD or lack of support for training in using SIAKAD. To overcome these obstacles, it is necessary to make efforts to increase management support and adequate technology in the development of SIAKAD in tertiary institutions. For example, improving SIAKAD technology systems and services and allocating adequate budgets for system development and maintenance. Universities also need to provide training and support to lecturers and staff in using SIAKAD so that the benefits provided can be maximized. In addition, periodic evaluations are carried out to ensure that the use of SIAKAD in tertiary institutions runs well and provides significant benefits.
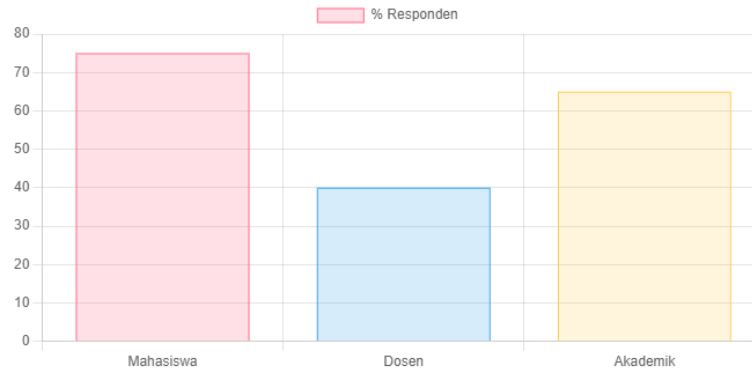

Figure 2. Percentage of SIAKAD Usage

Table 1. Variables and Questions

No	Variable	Question
1	Demographic data	Age, Gender, Education, Occupation
2	Use of the Academic Information System (SIAKAD)	Frequency of use, Ease of use, System reliability
3	User's desire and preference to improve SIAKAD	New features desired, Types of additional services expected
4	User perception of the importance of SIAKAD	How important is SIAKAD in academic decision making, how important is SIAKAD in scheduling
5	The level of user satisfaction with SIAKAD	How satisfied are they with the current system, how often do they experience difficulties when using it
6	User response to changes in SIAKAD	How amenable are they to the change, how ready are they to adapt to the change

The table above shows the results of a survey on the use of Academic Information Systems (SIAKAD) in tertiary institutions, which was conducted on 100 respondents consisting of students, lecturers, and academic staff. This table contains demographic data of respondents, such as gender, age, education, and occupation, as well as information about the current use of SIAKAD, user desires and preferences to improve SIAKAD, user perceptions of the importance of SIAKAD in supporting academic activities, the level of user satisfaction with current SIAKAD this, and user responses to changes that have been or will be made to SIAKAD. From this table, most respondents are students, and most of them are women. Most of the respondents are aged between 18-24 years, have undergraduate education, and occupy positions as students or lecturers. Many respondents use SIAKAD every day and find it easy to use. However, some respondents experienced difficulties in accessing data and experienced technical problems when using SIAKAD. Many respondents want a more reliable SIAKAD, and require new features such as mobile access, more accurate and up-to-date academic information, and ease in sending and receiving messages. Most respondents also feel that SIAKAD is very important in supporting their academic activities and they are mostly satisfied with the current system. Most of the respondents responded positively to the changes in SIAKAD and were willing to adapt to these changes.

3.2 Discussion

Academic Information System Revitalization (SIAKAD) in tertiary institutions has the potential to provide many advantages and benefits. One of the benefits that can be obtained is the increased efficiency and effectiveness of academic administration. By using an integrated and centralized SIAKAD, the academic administration process can become more structured and automated. This can reduce the time and costs required in data processing, as well as minimize the risk of errors occurring in the academic administration process. In addition, SIAKAD revitalization can also improve the quality of academic services provided by universities. With SIAKAD, students, lecturers, and other related parties can access academic information more easily and quickly. This information includes class schedules, grades, attendance, and other academic information. This can make it easier for students to access the academic information they need, so that they can

use their time and resources more effectively and efficiently. In addition, SIAKAD can provide benefits in facilitating access to academic data for students, lecturers, and other related parties. With SIAKAD, students can access their academic information online, so they don't have to come to campus to check academic information in person. In addition, SIAKAD also makes it easier for lecturers to access student academic data, such as grades and attendance, so they can monitor student academic development more efficiently. Thus, the revitalization of SIAKAD has the potential to provide many benefits and advantages for universities. Besides being able to increase the efficiency and effectiveness of academic administration, SIAKAD revitalization can also improve the quality of academic services, and facilitate access to academic data for students, lecturers, and other related parties. Therefore, tertiary institutions need to consider revitalizing SIAKAD as an effort to improve the quality of academic services and academic administration.

4. Related Work

In recent years, many studies have been conducted to develop web-based academic information systems. These systems have become crucial as they facilitate educational administrators in managing academic data and information. Several studies have resulted in interesting outcomes and have been successfully applied in various educational institutions. Sahrul *et al*. (2016) conducted research on the implementation of a web-based academic information system using the Laravel framework. Their study showed that the use of the Laravel framework can simplify the development process of a web-based academic information system. The framework has features such as routing, migration, and Eloquent ORM that facilitate development. Additionally, the use of this framework can minimize errors in writing code, making the system more effective and efficient [1]. Prihandoyo (2018) used the Unified Modeling Language (UML) model to develop an academic information system. The results of the study showed that the use of the UML model can simplify the development process and improve the quality of the system produced [2]. Ismail *et al*. (2018) developed a cloud-based academic information system for the Mandiri Banda Aceh Pharmacy Academy. The study showed that the use of cloud computing can simplify the development process of academic information systems since cloud servers can increase storage capacity and accelerate data access [3]. Kesuma and Kholifah (2019) developed a web-based academic information system for the Rejeki Cilacap LKP. The study showed that the academic information system was developed to facilitate the management of academic data and schedule management [4]. Ariyanti *et al*. (2020) developed an academic and administrative information system using the Extreme Programming method for a training and course institution. The study showed that the use of the Extreme Programming method can speed up the development process and improve the quality of the resulting system [5]. Ayunandita and Riskiono (2021) developed an academic information system modeling using Extreme Programming at the Mambaul Ulum Tanggamus Islamic Senior High School. The study showed that the use of Extreme Programming can speed up the development process and improve the quality of the resulting system [6]. Saputra *et al*. (2022) conducted an evaluation of the quality of the academic information system website at the Nusantara PGRI Kediri University. The study aims to evaluate the quality of the website and provide recommendations to improve its quality [7]. Syahputra *et al*. (2023) developed an academic information system for the Pasar Ambacang 19 Elementary School based on PHP and database technologies. The study aims to help manage academic data in elementary schools using web technology and a database [8]. Pongmakamba and Tambotoh (2023) evaluated the Satya Wacana academic information system by applying the mandatory use of software technologies model. The study aims to evaluate the quality and effectiveness of the use of the information system [9]. In summary, these studies show the importance of web-based academic information systems in managing academic data and information. They also demonstrate the different approaches and methods used in developing these systems, highlighting the advantages and disadvantages of each.

The use of information and communication technology (ICT)-based academic information systems (SIA) has been proven to increase efficiency and effectiveness in managing academic data and information in tertiary institutions. However, to achieve optimal effectiveness, SIAs need to be well designed and pay attention to the user experience. Several studies have been conducted to analyze the quality of SIA services and their impact on user satisfaction. The results show that the quality of SIA services has a significant influence on user satisfaction and the overall quality of academic services. Several studies also show that the implementation of Android-based SIA can increase the effectiveness of academic data management in schools. For example, the use of an android-based SIA at SMA Negeri 1 Tempilang can facilitate the management of class schedules and input of grades by teachers, as well as facilitate access to information for students' parents. In addition, the factor of user acceptance of SIA is also very important, especially related to the quality of the information presented, ease of use, and trust in the system. Therefore, the revitalization of SIA is a new solution in facing the challenge of digitizing education. In this revitalization, it is necessary to pay attention to good system design and pay attention to user experience and user acceptance factors. With a well-designed SIA that pays attention to user experience and user acceptance factors, it is hoped that it can increase efficiency and effectiveness in managing academic data and information, as well as increase user satisfaction and the overall quality of academic services.

Several related studies have been conducted regarding the use of the Academic Information System (SIAKAD) in tertiary institutions. For example, research conducted by Abdillah *et al*. (2020) shows that SIAKAD has benefits in increasing the performance and efficiency of academic administration in tertiary institutions. The research also shows that SIAKAD can increase the accessibility of academic information for students and lecturers. However, this study also

shows that there are still obstacles in using SIAKAD, such as a lack of adequate management and technology support. Another study conducted by Al-Samarraie *et al.* (2019) shows that the use of SIAKAD can improve the quality of academic services and speed up the process of academic administration in tertiary institutions. This research also shows that SIAKAD can increase the efficiency and effectiveness of academic data processing, as well as facilitate access to academic information for students and lecturers. However, this research also shows that there are still some obstacles in using SIAKAD, such as technical problems and lack of support from higher education management. Another study conducted by Darmawan and Kurniawan (2019) shows that the use of SIAKAD can improve the quality of academic services in tertiary institutions. This research also shows that SIAKAD can increase the efficiency and effectiveness of academic administration and facilitate access to academic information for students and lecturers. However, this research also shows that there are still some obstacles in using SIAKAD, such as the lack of support from university management and the lack of training for SIAKAD users. From several related studies, it can be concluded that the use of the Academic Information System (SIAKAD) in tertiary institutions provides significant benefits in increasing the efficiency and effectiveness of academic administration, facilitating access to academic information for students and lecturers, and improving the quality of academic services. However, there are still obstacles in using SIAKAD, such as technical problems, lack of support from university management, and lack of training for SIAKAD users. Therefore, it is necessary to make efforts to increase adequate management and technological support in the development of SIAKAD in tertiary institutions as well as provide training and support to SIAKAD users.

5. Conclusion

In this study, we have investigated the use of SIAKAD in academic administration in tertiary institutions. The results of the study show that SIAKAD can provide significant benefits in increasing the efficiency and effectiveness of academic administration in tertiary institutions. However, there are several obstacles that need to be overcome, such as technical problems, lack of management support, and the need for training and technical support for SIAKAD users. Therefore, it is necessary to make efforts to improve adequate management and technological support in the development and implementation of SIAKAD in tertiary institutions. This can help improve SIAKAD technology systems and services as well as provide necessary training and support to SIAKAD users. In addition, discussions and collaborative actions between higher education management, lecturers and staff are expected to help increase the benefits of SIAKAD in academic administration and help improve the quality of academic services in tertiary institutions. In this study, we investigated the use of the Academic Administration Information System (SIAKAD) in tertiary institutions to increase the efficiency and effectiveness of academic administration. We found that the use of SIAKAD provides significant benefits in optimizing academic administration processes, such as student data management, class schedules, attendance, and academic scores.

However, in the implementation of SIAKAD there are several obstacles that need to be overcome. First, technical issues, such as limited server capacity, system updates, and hardware maintenance, which are a hindrance for users. Second, the lack of higher education management support for the use of SIAKAD. This happens because some managers do not have sufficient understanding of information technology, which hinders the optimal use of SIAKAD. In addition, adequate training and technical support is required for SIAKAD users to maximize the use of this system. Many users find it difficult when using SIAKAD, especially at the beginning of its use. The availability of adequate technical support can assist users in overcoming problems that arise and improve the quality of academic services in tertiary institutions. In overcoming these obstacles, efforts are needed to improve management support and adequate technology in the development and implementation of SIAKAD in tertiary institutions. This can help improve SIAKAD technology systems and services as well as provide necessary training and support to SIAKAD users. In addition, discussions and collaborative actions between higher education management, lecturers and staff are expected to help increase the benefits of SIAKAD in academic administration and help improve the quality of academic services in tertiary institutions. Thus, SIAKAD can be an effective and efficient solution in improving the quality of academic administration services in tertiary institutions.

References

[1]   Firma Sahrul, B., Safi'ie, M.A. and WA, O.D., 2016. Implementasi Sistem Informasi Akademik Berbasis Web Menggunakan Framework Laravel. *TRANSFORMASI*, *12*(1).

[2]   Prihandoyo, M.T., 2018. Unified Modeling Language (UML) Model Untuk Pengembangan Sistem Informasi Akademik Berbasis Web. *Jurnal Informatika: Jurnal Pengembangan IT*, *3*(1), pp.126-129. DOI: http://dx.doi.org/10.30591/jpit.v3i1.765.

[3]   Ismail, I., Harmisal, H. and Jumaidin, T.F., 2018. Sistem Informasi Akademik Berbasis Cloud pada Akademi Farmasi Mandiri Banda Aceh. *Jurnal JTIK (Jurnal Teknologi Informasi dan Komunikasi)*, *2*(1), pp.34-40. DOI: https://doi.org/10.35870/jtik.v2i1.48.

[4]   Kesuma, C. and Kholifah, D.N., 2019. Sistem Informasi Akademik Berbasis Web Pada Lkp Rejeki Cilacap. Available at: https://repository.bsi.ac.id/index.php/unduh/item/239088/Sistem-Informasi-Akademik-Berbasis-Web-pada-LKP-Rejeki-Cilacap.pdf.

[5]   Ariyanti, L., Satria, M.N.D. and Alita, D., 2020. Sistem Informasi Akademik Dan Administrasi Dengan Metode Extreme Programming Pada Lembaga Kursus Dan Pelatihan. *Jurnal Teknologi Dan Sistem Informasi*, *1*(1), pp.90-96. DOI: https://doi.org/10.33365/jtsi.v1i1.214.

[6]   Ayunandita, N. and Riskiono, S.D., 2021. Permodelan Sistem Informasi Akademik Menggunakan Extreme Programming Pada Madrasah Aliyah (Ma) Mambaul Ulum Tanggamus. *Jurnal Informatika Dan Rekayasa Perangkat Lunak*, *2*(2), pp.194-204. DOI: https://doi.org/10.33365/jatika.v2i2.922.

[7]   Saputra, D.A., Sucipto, S. and Andriyanto, T., 2022. Analisis Kualitas Website Sistem Informasi Akademik Universitas Nusantara PGRI Kediri. *RESEARCH: Journal of Computer, Information System & Technology Management*, *5*(1), pp.17-22. DOI: http://doi.org/10.25273/research.v5i1.9350.

[8]   Syahputra, M., Sunaryo, N. and Hanifa, A., 2023. Sistem Informasi Akademik SDN 19 Pasar Ambacang Berbasis PHP dan Database. *Jurnal Sains dan Teknologi (JSIT)*, *3*(1), pp.184-192. DOI: https://doi.org/10.47233/jsit.v3i1.563.

[9]   Pongmakamba, C.Y. and Tambotoh, J.J., 2023. Evaluasi Sistem Informasi Akademik Satya Wacana Menerapkan Model for Mandatory Use of Software Technologies. *JURIKOM (Jurnal Riset Komputer)*, *10*(2), pp.387-395. DOI: http://dx.doi.org/10.30865/jurikom.v10i2.5837.

[10]   Indrayani, E., 2011. Pengelolaan sistem informasi akademik perguruan tinggi berbasis Teknologi Informasi Dan Komunikasi (TIK). *Jurnal Penelitian Pendidikan*, *12*(1), pp.51-67. Avalaible at: http://repository.upi.edu/id/eprint/7863.

[11]   Nisah, A.K. and Ajie, H., 2021. Perancangan berbasis User Experience pada Modul Admin Sistem Informasi Akademik Universitas Negeri Jakarta. *PINTER: Jurnal Pendidikan Teknik Informatika dan Komputer*, *5*(2), pp.56-64. DOI: https://doi.org/10.21009/pinter.5.2.9.

[12]   Danella, R., 2012. Analisis Efektivitas Sistem Informasi Akademik Universitas Negeri Surabaya. *Jurnal Ilmiah, Universitas Negeri Surabaya*.

[13]   Negara, I.S.M. and Savitri, F.M., 2019. Analisis penerimaan pengguna sistem informasi akademik, studi kasus stikes harapan bangsa. *Solusi*, *17*(3).

[14]   Sylfania, D.Y., Juniawan, F.P. and Agusti, L., 2019. Implementasi Sistem Informasi Akademik Berbasis Android pada SMA Negeri 1 Tempilang. *JEPIN (Jurnal Edukasi dan Penelitian Informatika)*, *5*(3), pp.301-307. DOI: http://dx.doi.org/10.26418/jp.v5i3.33276.

[15]   Septiani, Y., Aribbe, E. and Diansyah, R., 2020. Analisis Kualitas Layanan Sistem Informasi Akademik Universitas Abdurrab Terhadap Kepuasan Pengguna Menggunakan Metode Sevqual (Studi Kasus: Mahasiswa Universitas Abdurrab Pekanbaru). *Jurnal Teknologi Dan Open Source*, *3*(1), pp.131-143. DOI: https://doi.org/10.36378/jtos.v3i1.560.

[16]   Nada, N.Q. and Wibowo, S., 2015. Pengukuran kualitas layanan sistem informasi akademik menggunakan metode webqual 4.0. *Jurnal Informatika UPGRIS*, *1*(2 Desember).

[17]   Utomo, L.T., Ardianto, Y.T. and Sisharini, N., 2017. Pengaruh kualitas sistem, kualitas informasi, kualitas layanan, terhadap kepuasan pengguna sistem informasi akademik universitas merdeka malang. *Jurnal Teknologi dan Manajemen Informatika*, *3*(2). DOI: https://doi.org/10.26905/jtmi.v3i2.1425.

[18]   Vivi Sahfitri, V.S. and Evi Yulianingsih, E.Y., 2015. Kualitas layanan sistem informasi akademik menggunakan metode kano. *MATRIK*, *17*(2), pp.151-162. Available at: http://eprints.binadarma.ac.id/2769/.

[19] Yindrizal, Y., 2021. Dampak Penggunaan Sistem Informasi Akademik Untuk Meningkatkan Kualitas Pelayanan Akademik Mahasiswa Universitas Andalas Padang. *Jurnal Manajemen Publik dan Kebijakan Publik (JMPKP)*, *3*(1). DOI: https://doi.org/10.31004/jpdk.v4i4.6462.

[20] Zakiyyah, A.M., 2019. Kualitas Pelayanan Sistem Informasi Akademik Pada Kepuasan Mahasiswa Menggunakan Metode Webqual 4.0. *JUSTINDO (Jurnal Sistem dan Teknologi Informasi Indonesia)*, *4*(1), pp.1-6. DOI: https://doi.org/10.32528/justindo.v4i1.2416.