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Analysis of User Satisfaction Level Of the Online Lecture Information System (Sikuli) using The EUCS Method at Universitas Muhammadiyah Riau

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Abstract

The effectiveness of an information system is a key determinant of user pleasure, specifically within digital gaining knowledge of platforms. This studies seeks to evaluate the satisfaction degree of customers towards the the Online Lecture Information System (SIKULI) at Universitas Muhammadiyah Riau, employing the EUCS method. The study similarly investigates the tremendous participants to user satisfaction by using analyzing 5 dimensions from the EUCS making use of a quantitative technique, the studies implemented accidental sampling, related to ninety nine lively college students as respondents. facts evaluation was achieved the use of the SmartPLS software to discover the electricity and course of relationships a number of the variables. The analysis found out that simplest ease of use and timeliness had a statistically tremendous effect on user satisfaction, whereas content, accuracy, and format did not exhibit outstanding effects. those effects emphasize that ease of use and timeliness are key factors in improving satisfaction with SIKULI. consequently, this have a look at offers sensible pointers for technical improvements to optimize the performance of academic information systems.

Keywords: Information System, User Satisfaction, SIKULI, EUCS, SmartPLS

1 Introduction

The quality of a website greatly influences how satisfied users are. A high-quality website tends to attract more visitors. The effectiveness and success of an information system's quality rely heavily on how actively users engage with the existing technological infrastructure. Active user involvement in operating information systems is important for ensuring the system's fulfillment and the reliability of the information it delivers. When the information provided matches user expectations, it contributes to increased user satisfaction [1]. Muhammadiyah University of Riau has developed the Integrated Administration Management System (SMART UMRI) website to support information dissemination, including academic features such as an e-learning system called SIKULI, the e-learning lecture information platform, which is connected to the student database and accessible by both students and lecturers [2].

The SIKULI website of Muhammadiyah University of Riau, accessible at sikuli.umri.ac.id, was introduced at Since the COVID-19 pandemic in 2019. Users of this website include active students, lecturers, and university staff. The UPT TIPD developed this system to support the smooth running of lectures and to help cultivate outstanding future graduates [3]. In the use of the SIKULI system at Universitas Muhammadiyah Riau, several issues have been identified that affect the user experience. Students face challenges due to the limited maximum file size, which makes it difficult to upload large assignments. Additionally, repeated message submissions in the discussion chat disrupt communication among students. Technical issues also arise, such as incorrect password entries and the system’s inability to upload multiple files at once, which hinder the usability of the system. Lastly, errors in attendance submission lead to delays that may prevent students from participating in exams such as midterms (UTS) and finals (UAS).

Analysis is the process of breaking down an information system into its main components to identify and evaluate existing problems, opportunities, and needs, with the aim of proposing

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appropriate solutions [4]. System analysis is a technique used to decompose system components and evaluate how each part functions and interacts to achieve specific objectives [5]. E-learning is a learning method that delivers instructional materials through networks such as the internet or intranet, and involves asynchronous learning activities using electronic devices, such as computers, to access materials according to the learners' needs [6]. An information system is a collection of hardware, software, human sources, procedures, and rules which can be designed in an integrated way to manner facts into useful data for solving problems and supporting decision-making [7]. Applied in analyzing user satisfaction with an online learning information system is the EUCS approach [8], which was introduced by Torkzadeh and Doll [9].

The EUCS method was introduced with the aim of assessing user satisfaction levels [10] with an information system by evaluating users' expectations with the actual performance of the system [11]. The measurement of user satisfaction reflects users' overall assessment primarily based on their experience using the system [12]. The method focuses on five key aspects to evaluate user satisfaction: content, accuracy, format, ease of use, and timeliness [13]. The purpose of this study is to assess the level of user satisfaction with the SIKULI Information System at Universitas Muhammadiyah Riau using the EUCS method, as well as to evaluate the factors that most significantly influence user satisfaction and identify technical obstacles in order to provide recommendations for service improvements.

2 Literature Review

This have a look at is based on theories and former research applicable to the analysis using the EUCS method. This visualization of the EUCS by Doll and Torkzadeh is presented in Figure 1.

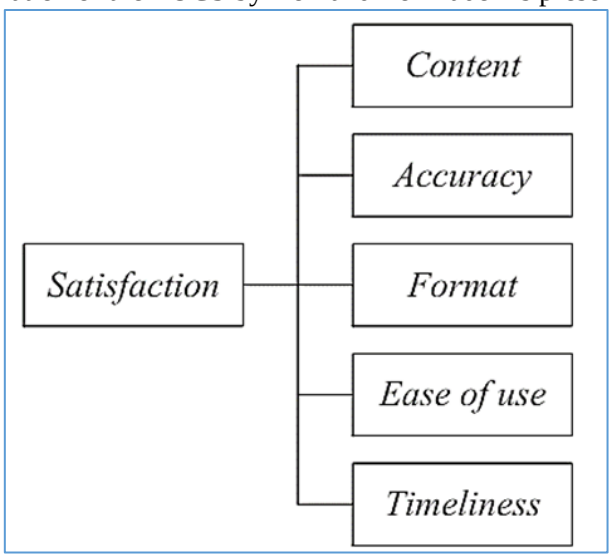

Figure 1. EUCS model concept

1. Content

Content measures user pleasure based totally on the system's content. The content typically consists of capabilities and features available to users, as well as the information produced by the system [14]. The content within an information system should be relevant to user needs and up-to-date [15]. The more complete the capabilities and the more informative [16].

2. Accuracy

Precision of the information produced by the system [17]. In this context, accuracy indicates the system's ability to process input and generate information correctly. The level of a system's accuracy can be assessed based on the number of errors that occur during data processing [15].

3. Format

Format relates to the layout and presentation of content within the system. A clear, appealing, and easy-to-understand interface can improve system effectiveness and user satisfaction [17].

4. Ease of Use

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Ease of use measures how easily users can operate the system, including entering data, processing it, and retrieving information [18].

5. Timeliness

Timeliness based on the speed at which the system delivers or provides the data and information needed by users [14]. The faster a system processes input and generates output, the more it can be considered timely or real-time [15].

Previous research has been conducted by several researchers. In 2023, a study by Mulyadi on the SIAKAD at Universitas Islam Kuantan Singingi showed that the user satisfaction level reached 62.8%. The Ease of Use variable was the most dominant factor, contributing 30.5%, indicating that ease of use significantly affects user satisfaction [19]. Furthermore, a study conducted by Rezalina in 2023, which analyzed SIAM at Poltekkes Riau using the EUCS method, found that three variables Content, Accuracy, and Timeliness had a positive influence on user satisfaction. Meanwhile, the variables Ease of Use and Format showed a negative influence, indicating issues related to user comfort and system interface design [12]. Another study conducted by Novializa in 2022 on students using the E-Learning system at STKIP PGRI Sumatera Barat concluded that the variables Content and Accuracy did not have a significant effect on user satisfaction. Conversely, the Format and Timeliness variables showed a positive and significant influence. Meanwhile, the Ease of Use variable did not exhibit a significant effect. Overall, the EUCS method was found to have a positive impact on user satisfaction [20].

3 Research Method

This study employs a quantitative approach aimed at measuring user satisfaction with the SIKULI at Universitas Muhammadiyah Riau. This method was chosen because it allows for an objective depiction based on numerical data analyzed statistically. EUCS method requires testing for validity and reliability to ensure the accuracy and dependability of the research instruments. The study was conducted through a series of systematically designed stages to ensure the research objectives are achieved effectively and purposefully.

3.1 Planning Stage

In this stage, the researcher identifies issues related to user satisfaction with the SIKULI system, focusing on the effectiveness, efficiency, and quality of services from the students' perspective. The proposed hypothesis states that the aspects within the EUCS method. Primary data were obtained through surveys administered to students, while secondary data were collected from literature reviews and related sources [21]. The sampling method used was non-probability sampling with an accidental sampling, which involves selecting respondents by chance who are deemed appropriate as data sources [22].

3.2 Data Collection Stage

Inside the data collection stage, the researcher began by conducting a literature review to gain a deeper information of the research topic and to define the existing problems. The literature sources included books, research journals, and expert publications relevant to the topic. This literature review served as the reference foundation for analyzing user satisfaction levels with the SIKULI at Universitas Muhammadiyah Riau using the EUCS method. Subsequently, the researcher conducted observations of the SIKULI system to evaluate the user interface and identify potential issues. Interviews were also carried out with the personnel responsible for managing the SIKULI website at Universitas Muhammadiyah Riau to gain deeper insights into the system's usage. These interviews aimed to understand the management's perspective on the factors affecting user satisfaction.

Afterward, the researcher distributed questionnaires to students of Universitas Muhammadiyah Riau. The questionnaires were shared online via WhatsApp and Instagram using Google Forms to facilitate the data collection process. The sampling technique employed was accidental sampling, meaning that respondents were selected randomly based on convenience specifically, students who happened to be encountered and met the research criteria.

The researcher used Slovin's formula (1) to determine the number of respondents as follows:

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$$n = \frac{N}{1 + Ne^2} \quad (1)$$

N = 9485
e = 10% = 0,1

$$n = \frac{9485}{1 + 94{,}85(0{,}1^{2)}}$$
$$n = \frac{9485}{1 + 94{,}85}$$
$$n = \frac{9485}{95{,}85}$$
$$n = 98{,}95$$

99 respondents participated in this study. The details of the scale are presented in Table 1, consisting of four levels: 1 for Very Not Agree (VNA), 2 for Not Agree (NA), 3 for Agree (A), and 4 for Very Agree (VA) [23].

Table 1. Likert scale

Score	Description	Code
1	Very Not Agree	VNA
2	Not Agree	NA
3	Agree	A
4	Very Agree	VA

Table 2 presents the list of questionnaire items which were adapted from previous research and modified to fit the objectives of the current study.

Table 2. Questionnaire items

Variable	Indicator	Measurement Items
Content	CON1	Is the content of the information in SIKULI in accordance with your needs? [24], [25]
	CON2	Is the data provided by SIKULI in accordance with your needs? [26]
	CON3	Does SIKULI provide complete information? [27], [28]
	CON4	Does SIKULI provide sufficient and useful information? [29]
Accuracy	ACC1	Does SIKULI display accurate information? [30], [31], [32]
	ACC2	Does every feature you click on in SIKULI always direct you to the correct page? [33], [34]
	ACC3	Are you satisfied with the accuracy of the information provided by the SIKULI system? [35], [36]
Format	FOR1	Does SIKULI have a layout design that makes it easy for users to navigate and use the available features? [37], [38], [39]
	FOR2	Is the color scheme of the SIKULI system aesthetically pleasing and comfortable to view, with a good harmony of colors? [37], [38], [39]
	FOR3	Does the font design in the SIKULI system have an appropriate size, and are the icons and text easy to understand? [37], [38], [39]
Ease of Use	EOU1	Is the SIKULI system user-friendly and easy to understand? [40], [41]
	EOU2	Is the SIKULI system easy to use? [42], [43]
	EOU3	Is the use of SIKULI free from technical issues (such as difficulties in submitting assignments, problems with

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		attendance, and login issues) [44]
Timeliness	TM1	Does the SIKULI system provide the information you need in a timely manner and according to your needs? [45], [46], [42]
	TM2	Does the SIKULI system respond to your requests quickly when accessing features or data? [47], [48]
	TM3	Does SIKULI provide up-to-date information? [44]
User Satisfaction	USN1	Is the SIKULI system efficient for daily academic activities? [49]
	USN2	Is the SIKULI system effective for academic activities? [49]
	USN3	Overall, are you satisfied with the performance of the SIKULI system? [50]

3.3 Data Processing Stage

This stage involves the processing and analysis of the questionnaire data collected from students at Universitas Muhammadiyah Riau regarding the use of the SIKULI. The analysis is conducted descriptively using SmartPLS, based on the dimensions of the EUCS method. The validity and reliability of the instruments are tested through outer model analysis using loading factor values, AVE, Composite Reliability, and Cronbach's Alpha. Meanwhile, the inner model evaluation includes R-square, path coefficients and t-statistics tests to determine the strength of relationships between variables and the predictive relevance of the model [51].

3.4 Data Analysis Stage

The data analysis stage is conducted to assess the level of student satisfaction at Universitas Muhammadiyah Riau regarding the use of the SIKULI based on the dimensions of the EUCS method. This analysis is carried out by testing hypotheses for each of the EUCS variables to determine the extent to which each variable influences user satisfaction. Furthermore, this analysis aims to identify which variable has the most dominant impact on student satisfaction in using SIKULI. The variable with the most significant influence is determined based on its coefficient value and contribution in the hypothesis test results obtained through statistical data processing using the SmartPLS software.

4 Results and Analysis

The questionnaire data obtained from 99 respondents was then analyzed the use of a descriptive demographic approach and structural modeling methods based on Partial Least Squares (PLS-SEM) to obtain the results of the outer model and inner model.

4.1 Respondent Characteristics Analysis

Respondents in this study were analyzed based on faculty, study program, and educational level. Based on faculty, the majority of respondents came from the Faculty of Mathematics and Natural Sciences (MIPA) and Health (37%), followed by the Faculty of Economics and Business (28%), and the Faculty of Computer Science (11%). Respondents from the Faculty of Engineering accounted for 6%, while the Faculties of Islamic Studies, Teacher Training and Education, and Communication Sciences each accounted for 5%. Meanwhile, the Faculty of Law had the fewest respondents, with only 2%. In terms of study programs, the largest number of respondents were from the D-3 Nursing program (24%) and the S-1 Management program (21%). The remaining respondents were spread across various other study programs such as S-1 Informatics Engineering, S-1 Development Economics, S-1 Pharmacy, and others, with percentages ranging from 1% to 6%. Regarding educational level, the majority of respondents were from the Strata 1 (S1) program, accounting for 74%, while 25% were from the Diploma 3 (D3) program.

4.2 SmartPLS Path Diagram Results

The data on this research were processed and analyzed utilizing SmartPLS. The analytical procedure involved two core stages, Outer Model and Inner Model. The components were examined through the application of a previously developed path diagram. Path Diagram Flow visualization is presented in Figure 2 .

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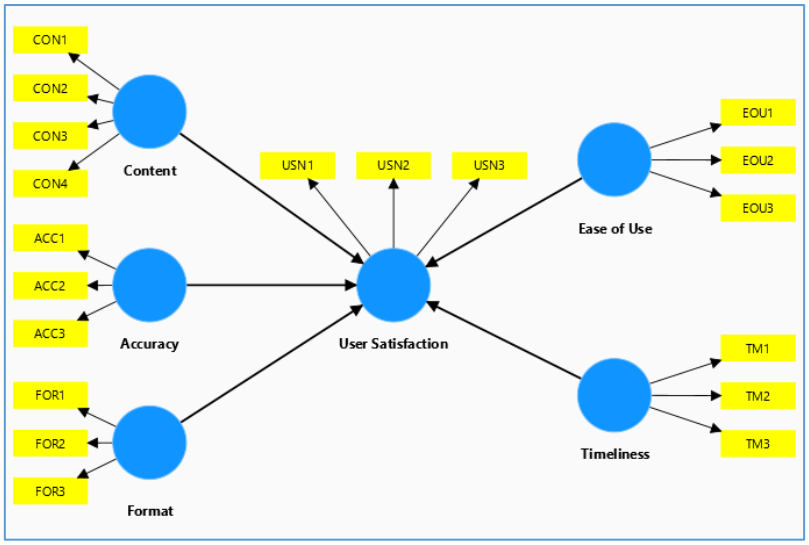

Figure 2. Path diagram flow

4.3 Measurement Model Results (Outer Model)

This model to evaluate the validity and reliability levels of the constructs derived from each questionnaire item. This process is essential to ensure that the instrument used accurately and consistently represents and measures the research variables.

a. Validity Test

In the SEM-PLS approach, two methods are used to assess validity: convergent and discriminant. Convergent validity is considered achieved when each indicator has a loading value greater than 0.500. All displayed indicators show values exceeding 0.500. As shown in Table 3.

Table 3. Convergent validity values

Indicator	Value	Description
CON1	0,840	Valid
CON2	0,916	Valid
CON3	0,889	Valid
CON4	0,883	Valid
ACC1	0,844	Valid
ACC2	0,871	Valid
ACC3	0,900	Valid
FOR1	0,929	Valid
FOR2	0,926	Valid
FOR3	0,937	Valid
EOU1	0,887	Valid
EOU2	0,793	Valid
EOU3	0,807	Valid
TM1	0,930	Valid
TM2	0,899	Valid
TM3	0,795	Valid
USN1	0,927	Valid
USN2	0,894	Valid
USN3	0,814	Valid

Discriminant Validity Test within the measurement model is conducted by analyzing the Cross Loading values. Ideally, each indicator should exhibit the highest loading on the construct it is designed to measure, rather than on other constructs. This assessment as shown in Table 4.

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Table 4. Discriminant validity values

Indicator	AC	CN	EOU	FOR	TM	USN	ACC
ACC1	**0,844**	0,727	0,628	0,668	0,722	0,646	0,844
ACC2	**0,871**	0,613	0,610	0,590	0,628	0,670	0,871
ACC3	**0,900**	0,684	0,715	0,709	0,678	0,725	0,900
CON1	0,637	**0,840**	0,691	0,727	0,660	0,658	0,637
CON2	0,723	**0,916**	0,711	0,762	0,692	0,717	0,723
CON3	0,662	**0,889**	0,629	0,709	0,712	0,646	0,662
CON4	0,704	**0,883**	0,568	0,598	0,702	0,651	0,704
EOU1	0,763	0,701	**0,887**	0,770	0,755	0,805	0,763
EOU2	0,487	0,515	**0,793**	0,561	0,547	0,572	0,487
EOU3	0,576	0,600	**0,807**	0,689	0,680	0,653	0,576
FOR1	0,705	0,755	0,760	**0,929**	0,676	0,759	0,705
FOR2	0,624	0,685	0,779	**0,926**	0,673	0,658	0,624
FOR3	0,771	0,771	0,753	**0,937**	0,684	0,679	0,771
TM1	0,722	0,758	0,746	0,697	**0,930**	0,766	0,722
TM2	0,758	0,689	0,744	0,651	**0,899**	0,763	0,758
TM3	0,542	0,607	0,621	0,559	**0,795**	0,673	0,542
USN1	0,787	0,744	0,768	0,671	0,800	**0,927**	0,787
USN2	0,627	0,603	0,735	0,640	0,744	**0,894**	0,627
USN3	0,639	0,648	0,675	0,682	0,662	**0,814**	0,639

In the Cross Loading table, five reflective variables show that each indicator has a higher loading value on the variable it is measuring compared to other variables. This indicates that the relationship between the indicators and the constructs can be considered to have met the Discriminant Validity criteria well. In addition, another way to measure is by using the Average Variance Extracted (AVE) value. If the AVE value for each construct exceeds 0.500, the model is considered to have met the requirement. The AVE values as shown in Table 5.

Table 5. Average variance extracted values

Variabel	AVE	Description
Content	0,779	Valid
Accuracy	0,760	Valid
Format	0,866	Valid
Ease of Use	0,689	Valid
Timeliness	0,768	Valid
User Satisfaction	0,773	Valid

The AVE values for the EUCS variables are above the threshold, indicating that the constructs have satisfactorily met the criteria for Convergent Validity.

b. Reliability Test

Reliability measurement can be conducted using two approaches: Composite Reliability and Cronbach's Alpha. If both values exceed 0.700, the variable is considered to have a good level of reliability. Test results as shown in Table 6 .

Table 6. Composite reliability and cronbach's alpha values

Variable	Cronbach's Alpha	Composite Reliability	Description
Content	0,905	0,934	Reliable
Accuracy	0,842	0,905	Reliable
Format	0,923	0,951	Reliable
Ease of Use	0,775	0,869	Reliable
Timeliness	0,847	0,908	Reliable
User Satisfaction	0,852	0,911	Reliable

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In Table 6 it is found that all values exceed the specified threshold. Therefore, the EUCS constructs are considered to have met the criteria for relatively good reliability.

4.4 Structural Model Analysis (Inner Model)

The model used to observe the causal relationships between variables that cannot be directly measured (also known as latent variables). Evaluation of the inner model is carried out by examining the R-Square value, which indicates the extent to which other variables influence the EUCS variable as the affected (endogenous) variable. Meanwhile, the influencing (exogenous) variables are assessed based on the path coefficient values and their significance is tested using the T-Test.

a. R-Square

The value of 0.750 indicates that the model is strong; a value around 0.500 suggests that the model is moderate; and a value near 0.250 shows that the model has a weak influence. Values as shown in Table 7.

Table 7. R-Square value of user satisfaction

Variable	R-Square	R-Square Adjusted
User Satisfaction	0,789	0,777

Based on the results shown in the figure above, the value is 0.789, indicating that the model falls into the strong category.

b. Path Coefficients

Values used to indicate the direction of the relationship between variables in a model, whether the relationship is positive or negative. These values range from -1.000 to 1.000. If the value falls between -1.000 and 0.000, the relationship between variables is considered negative. Conversely, if it falls between 0.000 and 1.000, the relationship is positive. The values of the path coefficients as shown in Table 8.

Table 8. Path coefficient values

Variable	Path Coefficients
Content	0,072
Accuracy	0,183
Format	0,038
Ease of Use	0,319
Timeliness	0,357

Based on table 8, from the five paths analyzed, it can be observed that the Path Coefficient values for all paths namely between the EUCS variables toward User Satisfaction indicate a positive relationship.

4.5 Hypothesis Testing Results

The testing is performed to assess the volume of the relationships between variables inside the look at primarily based on dimension effects. one of the methods used to check hypotheses is via studying the Path Coefficients values. inside the Partial Least Square (PLS) method, every relationship formulated in the hypotheses is analyzed the usage of statistical simulation. This technique is accomplished through a Bootstrapping method at the sample data to reduce potential records mismatches or biases. A -tailed take a look at is used with a importance level of 5%. A hypothesis is taken into consideration significant if the t-statistic value exceeds 1.960. The effects of the Bootstrapping procedure through PLS analysis as shown in Table 9.

Table 9. Hypothesis test values

	Variable	T-Statistic	T-Table	Test Results
H1	Content - User Satisfaction	0,783	1,960	Rejected
H2	Accuracy - User Satisfaction	1,457	1,960	Rejected
H3	Format - User Satisfaction	0,288	1,960	Rejected
H4	Ease of Use - User Satisfaction	2,339	1,960	Accepted
H5	Timeliness - User Satisfaction	2,407	1,960	Accepted

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Prior to conducting the quantitative analysis, preliminary interviews were carried out with 10 active student users of SIKULI. The results showed that 7 of them had experienced difficulties when using the system. This finding provides an initial indication that several features of the system may need improvement and supports the need for further statistical testing on the factors influencing user satisfaction. Explanation of the data processing results for the five variables tested in the hypothesis is as follows:

1. **H1**
   The t-statistic value of 0.783, which is lower than the t-table value of 1.960, indicates that there is no significant effect of Content on User Satisfaction. Therefore, the first hypothesis is rejected. In other words, aspects related to content quality or limitations, such as file size restrictions, do not significantly influence user satisfaction.
2. **H2**
   The t-statistic value of 1.457, which falls below the t-table value of 1.960, shows that Accuracy does not have a significant effect on User Satisfaction. Thus, the second hypothesis is rejected. This means that the accuracy of the information presented in the system is not perceived as a key factor by users in determining their level of satisfaction.
3. **H3**
   The t-statistic value of 0.288, which is lower than the t-table value of 1.960, indicates that Format does not have a significant effect on User Satisfaction. Therefore, the third hypothesis is rejected. This implies that issues related to layout or repeated messages in the discussion feature do not significantly impact user satisfaction.
4. **H4**
   The t-statistic value of 2.339, which exceeds the t-table value of 1.960, indicates a significant effect of Ease of Use on User Satisfaction. Thus, the fourth hypothesis is accepted. This means that ease in using the system, such as during task submission or system navigation, positively contributes to user satisfaction.
5. **H5**
   The t-statistic value of 2.407, which is higher than the t-table value of 1.960, demonstrates that Timeliness has a significant effect on User Satisfaction. Therefore, the fifth hypothesis is accepted. This means that the timeliness of system services strongly influences student satisfaction, and delays in the system may negatively affect the user experience.

5 Conclusion

Only the variables Ease of Use and Timeliness demonstrated a statistically significant relationship with user satisfaction toward the SIKULI system. The first hypothesis, which tested the impact of Content, resulted in a t-value of 0.783 well below the critical threshold of 1.960 indicating no meaningful influence. Similarly, the variables Accuracy (t = 1.457) and Format (t = 0.288) also failed to meet the significance level, suggesting they do not have a notable effect on satisfaction levels. In contrast, the Ease of Use variable achieved a t-value of 2.339, and Timeliness scored 2.407 both exceeding the required threshold, confirming their significant impact. These findings suggest that users are more likely to be satisfied when the system is easy to operate and delivers timely performance, while other factors such as content volume, accuracy of data, and message formatting appear to have minimal effect. This research strengthens the relevance of the EUCS model in assessing academic information systems like SIKULI, particularly within the Indonesian higher education environment. From a practical standpoint, developers should prioritize improvements related to usability and responsiveness. Although initial qualitative input was collected through interviews with 10 students of which 7 indicated experiencing system-related issues the qualitative component remained limited.

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