Journal of Emerging Information Systems and Business Intelligence
ISSN: 2774-3993
Journal homepage: https://ejournal.unesa.ac.id/index.php/JEISBI/

User Satisfaction Analysis of SIDIA UNESA Based On Perceived Usefulness, System, Information, And Service Quality

Mukhtarul Fata An Nadwi[1], I Kadek Dwi Nuryana[2]
[1, 2] *Universitas Negeri SurabayaSurabaya, Indonesia*
mukhtarul.20045@mhs.unesa.ac.id, *dwinuryana@unesa.ac.id*

ABSTRACT

SIDIA UNESA (Sinau Digital UNESA) is an information system that supports lectures and administration at Surabaya State University. The purpose of this study was to determine the effect of perceived usefulness, system quality, information quality, and service quality variables on user satisfaction of the SIDIA UNESA system. A preliminary survey of several Surabaya State University students revealed that they were not fully satisfied with the services provided by SIDIA UNESA because several obstacles were often experienced by students. The research used quantitative methods with an associative descriptive approach. The analysis method used is Structural Equation Modeling (SEM) with the help of the SmartPLS application. The population in this study were UNESA students who were actively studying, with a sample size of 115 respondents. The findings revealed that the variables of perceived usefulness, system quality, information quality, and service quality positively impact user satisfaction with the UNESA SIDIA system. Additionally, the variables of perceived usefulness, system quality, information quality, and service quality simultaneously impact user satisfaction with the UNESA SIDIA system.

Keyword: Analysis, Perceived Uselfuness, System Quality, Information Quality, Service Quality, User Satisfaction, SIDIA UNESA.

Article Info:
Article history:
Received July 04, 2025
Revised July 10, 2025
Accepted July 15, 2025

Corresponding Author
Mukhtarul Fata An Nadwi
Universitas Negeri Surabaya, Surabaya, Indonesia
mukhtarul.20045@mhs.unesa.ac.id

1. INTRODUCTION

The rapid growth of information technology has played an essential role in the advancement of information systems as a means of obtaining and disseminating information in various disciplines, including education. In the field of education, using information systems is essential to increase the efficiency, productivity, and competitiveness of educational institutions in the era of globalization [1]. To implement information systems in education, most higher education institutions have started using academic information systems to provide information on student data, lecturers, finances, courses, and lecture schedules. In this case, the academic information system reflects the quality of management of a university in supporting quality educational services and convenience for students [2]. Thus, the academic information system is critical in boosting operational efficiency, ensuring the quality of educational services, and giving higher education students easy access to information.

Surabaya State University is one of the public universities in Surabaya City that has implemented an academic information system known as SIDIA UNESA (Sinau Digital UNESA). The system is designed to support students' lecture needs such as filling out study plan cards, information about lecture schedules, lecturer lists, study result cards, as well as notifications about UKT payment information. In its implementation, SIDIA UNESA has never been evaluated to determine its impact on student satisfaction. A preliminary survey of several Surabaya State University students revealed that they were not fully satisfied with the services provided by SIDIA UNESA because several obstacles were often experienced by students, such as the number of menus that were difficult to understand, frequent server downtime (especially when filling out KRS), lack of automatic data synchronization, unresponsive display on mobile devices, and inefficient navigation.

A good information system enhances user comfort, ensuring users perceive it as beneficial and satisfying. The level of satisfaction of information system users can be influenced by several main factors, one of which is perceived usefulness, which refers to the belief that using the system can improve user performance and productivity [3]. In addition, three factors measure user satisfaction in information system success: system quality, information quality, and service quality [4]. System quality refers to the combination of hardware and software that ensures the system meets user needs [5]. Then the quality of information also plays an important role, because poor information can hinder the achievement of system goals [6]. Service quality also contributes to user satisfaction by shaping their experience with the system [7].

Based on this explanation, the purpose of this study was to determine the effect of perceived usefulness, system quality, information quality, and service quality variables on user satisfaction of the SIDIA UNESA system.

2. METHODS

2.1 Problem Identification

Problem identification aims to determine the focus and scope of the research by collecting information and data from various sources, including conducting surveys. A preliminary survey of several Surabaya State University students revealed that they were not fully satisfied with the services provided by SIDIA UNESA because several obstacles were often experienced by students, such as the number of menus that were difficult to understand, frequent server downtime (especially when filling out KRS), lack of automatic data synchronization, unresponsive display on mobile devices, and inefficient navigation. These issues can hinder students' access to the necessary services.

2.2 Hypothesis Development

The variables used in this study are perceived usefulness, system quality, information quality, service quality, and user satisfaction. The following is the conceptual model used in this study (see Figure 1).

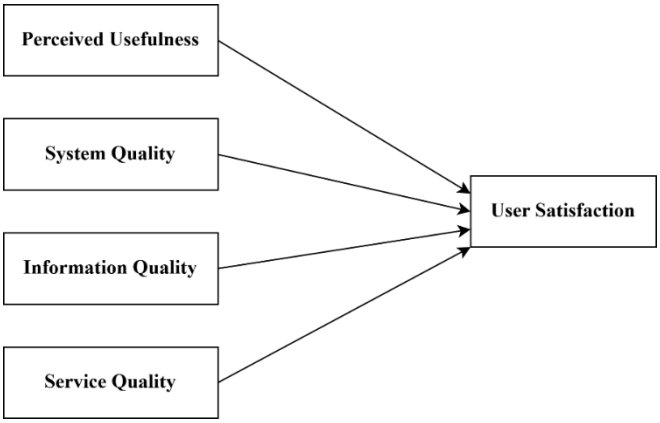

Figure 1. Conceptual Model

Based on the conceptual model, the researcher formulates several hypotheses to be tested in this study, including:

H_1 : Perceived usefulness positively impacts user satisfaction.
H_2 : System quality positively impacts user satisfaction.
H_3 : Information quality positively impacts user satisfaction.
H_4 : Service quality positively impacts user satisfaction.
H_5 : Perceived usefulness, system quality, information quality, and service quality simultaneously impact user satisfaction.

2.3 Determination of Population and Sample

The population in this study were all active students of Surabaya State University who were users of the Sinau Digital System (SIDIA UNESA). The sample size was determined using a probability sampling technique combined with a simple random sampling method. The sample size is calculated by between (5-10) multiplied by the number of indicators [8]. From this formula, the author took a sample of 5 x 23 = 115 samples, so the minimum number of samples used in this study was 115 respondents.

2.4 Preparation of Research Instruments

The following are the research instruments used in this study (see Table I).

Table 1. Research Instruments

Variable	Indicator	Code
Perceived Usefulness	SIDIA can speed up student work	X1.1
	SIDIA helps improve student performance	X1.2
	The use of SIDIA increases my productivity	X1.3
	SIDIA has a high level of effectiveness	X1.4
	SIDIA makes student work easier	X1.5
	SIDIA is very useful for students	X1.6
System Quality	The SIDIA system is easy to use for students	X2.1
	The data contained in SIDIA is well-integrated	X2.2
	SIDIA updates are by what users need	X2.3
	SIDIA has a fast response in carrying out user commands	X2.4
	The data in SIDIA is stored safely	X2.5
	SIDIA is reliable and rarely has interruptions	X2.6
Information Quality	SIDIA provides accurate information to students	X3.1
	Information provided by SIDIA is delivered promptly	X3.2
	The information provided by SIDIA is relevant to the needs of students	X3.3

Variable	Indicator	Code
Service Quality	SIDIA provides a reasonable guarantee of the quality of services provided	X4.1
	SIDIA provides a good feel and experience to users	X4.2
	SIDIA provides services that are responsive to student needs	X4.3
User Satisfaction	The contents contained in SIDIA provide satisfaction to students	Y1
	SIDIA provides accurate information data to students	Y2
	The user interface in SIDIA can give students a sense of satisfaction	Y3
	SIDIA provides convenience to students when using it	Y4
	SIDIA has accuracy in delivering information to students	Y5

2.5 Data Collection

The data used in this study are primary data collected through questionnaires distributed online through Google Forms to active students of Surabaya State University who use the UNESA SIDIA system. In addition, secondary data from various literature sources that support research are also used. The secondary data sources include previous research theses and journals.

2.6 Data Analysis

Data in this study was analyzed in two ways, namely descriptive and statistical analysis.

2.6.1 Descriptive Analysis

This analysis is conducted by summarizing respondent characteristics to determine their percentages, making the data easier to read and analyze.

2.6.2 Statistical Analysis

This analysis is conducted to determine whether there is an effect between variables. Statistical analysis was conducted using the SEM (Structural Equation Model) method with the assistance of SmartPLS software. The SEM analysis consists of:

a. Measurement Model Assessment (Outer Model)

An assessment is conducted to determine the representation of manifest variables with latent variables by examining the validity and reliability of each construct indicator.

b. Structural Model Assessment (Inner Model)

An assessment is conducted to measure the strength of the relationship between variables by analyzing the R^2 value.

c. Hypothesis Testing

Hypothesis testing is conducted using the bootstrapping method to examine and evaluate the impact between variables in the construct.

d. Simultaneous Testing

Simultaneous testing is conducted using the F test to examine the impact of the independent variables on the dependent variable collectively.

3. RESULTS AND DISCUSSION

3.1 Respondents' Characteristics

This study included 115 respondents. The respondents' characteristics were categorized based on their study program (see Table 2).

Table 2. Respondents' Characteristics

Study Program	Quantity
S1 Elementary Teacher Education	5
S1 Visual Communication Design	2

Study Program	Quantity
S1 Informatics Engineering	1
S1 Information System	64
S1 Biology	4
S1 Education Management	1
S1 Islamic Economics	1
S1 Nutrition	1
S1 Law Science	1
S1 Communication Science	2
S1 English Education	1
S1 Cosmetology Education	2
D4 Informatics Management	1
S1 Information Technology Education	3
S1 Management	4
S1 Fashion Education	2
S1 Out of School Education	3
S1 History Education	2
S1 Civil Engineering	2
D4 State Administration	1
S1 Javanese Language Education	1
S1 Sociology	1
S1 Science Education	2
S1 Nutrition Education	1
S1 Accounting	1
S1 Civic Education	1
S1 Sports Coaching Education	1
S1 State Administration	2
S1 Culinary	2
Total	**115**

3.2 Measurement Model Assessment (Outer Model)

The following are the results of the measurement model assessment that has been carried out by checking the validity and reliability of each construct indicator (see Figure 2).

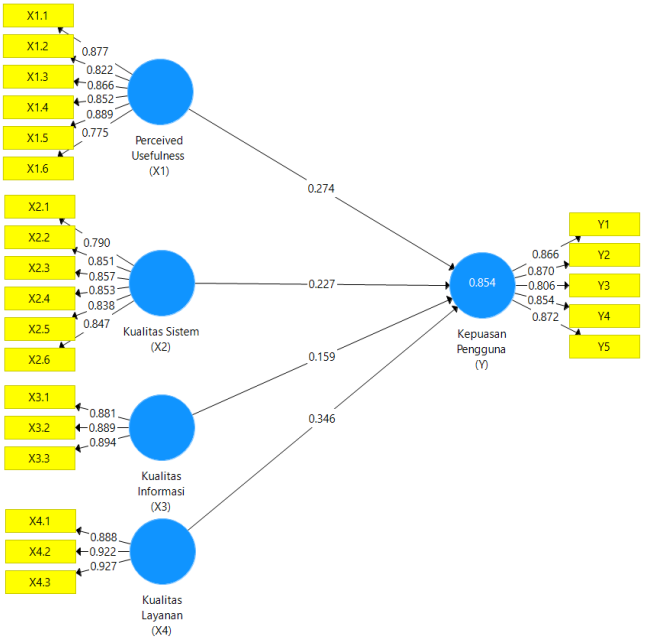

Figure 2. Outer Model Measurement Results

a. Outer Loading

One way to measure the effectiveness of a reflective indicator is by checking its factor loading value. A factor loading value of 0.50 or higher is considered sufficient to demonstrate the strength of the relationship between the indicator and its construct [8] (see Table 3).

Table 3. Outer Loading Results

Variables	Indicator	Outer Loading
Perceived Usefulness	X1.1	0.877
	X1.2	0.822
	X1.3	0.866
	X1.4	0.852
	X1.5	0.889
	X1.6	0.775
System Quality	X2.1	0.790
	X2.2	0.851
	X2.3	0.857
	X2.4	0.853
	X2.5	0.838
	X2.6	0.847
Information Quality	X3.1	0.881
	X3.2	0.889
	X3.3	0.894
Service Quality	X4.1	0.888
	X4.2	0.922
	X4.3	0.927
User Satisfaction	Y1	0.866
	Y2	0.870
	Y3	0.806
	Y4	0.854
	Y5	0.872

Based on these results, it is known that the outer loading value of all indicator items on each variable is larger than 0.50. Thus, the indicators for each variable met the conditions for convergent validity.

b. Cross Loading

Validity measurements can also be seen from the cross-loading table. The measurement is carried out to ensure that each indicator has the highest correlation with its construct compared to other constructs. If the value of the variable block with its indicator is higher than the value of the variable block with other indicators, the measurement model meets the discriminant validity requirements (see Table 4).

Table 4. Cross Loading Results

	X1	X2	X3	X4	Y
X1.1	0.877	0.665	0.658	0.658	0.706
X1.2	0.822	0.664	0.647	0.647	0.717
X1.3	0.866	0.702	0.683	0.683	0.726
X1.4	0.852	0.698	0.615	0.615	0.714
X1.5	0.889	0.691	0.662	0.662	0.738
X1.6	0.775	0.543	0.470	0.470	0.547
X2.1	0.644	0.790	0.686	0.717	0.687

	X1	X2	X3	X4	Y
X2.2	0.657	0.851	0.712	0.734	0.769
X2.3	0.647	0.857	0.587	0.748	0.697
X2.4	0.672	0.853	0.597	0.721	0.709
X2.5	0.658	0.838	0.647	0.683	0.734
X2.6	0.668	0.847	0.603	0.736	0.736
X3.1	0.618	0.587	0.881	0.659	0.679
X3.2	0.595	0.738	0.889	0.800	0.760
X3.3	0.675	0.695	0.894	0.758	0.728
X4.1	0.679	0.768	0.767	0.888	0.762
X4.2	0.639	0.791	0.753	0.922	0.782
X4.3	0.705	0.797	0.766	0.927	0.853
Y1	0.734	0.752	0.708	0.794	0.866
Y2	0.725	0.722	0.720	0.754	0.870
Y3	0.624	0.672	0.505	0.615	0.806
Y4	0.705	0.737	0.724	0.766	0.854
Y5	0.709	0.786	0.793	0.797	0.872

Based on these results, it is known that the cross loading value has met the discriminant validity requirements or has good validity, because the correlation value of each indicator on its latent variable (highlighted in yellow) is greater than the correlation value of the indicators on other variables.

c. Average Variance Extracted (AVE)

The AVE value indicates how much of the indicator variance is explained by the latent variables. A model is considered good if the AVE value for each construct exceeds 0.5, which is sufficient to demonstrate convergent validity [9] (see Table 5).

Table 5. Average Variance Extracted Results

Variables	AVE
Perceived Usefulness	0.718
System Quality	0.705
Information Quality	0.789
Service Quality	0.832
User Satisfaction	0.729

Based on these results, it is known that the AVE value of each variable exceeds 0.5. So it can be concluded that the indicators on each variable in this study have met the requirements of convergent validity.

d. Composite Reliability

Composite reliability is used to measure construct reliability. A construct is deemed to have adequate reliability if the composite reliability value exceeds 0.70, indicating that the indicators consistently measure the latent variable [8] (see Table 6).

Table 6. Composite Reliability Results

Variables	Composite Reliability
Perceived Usefulness	0.939
System Quality	0.935
Information Quality	0.918
Service Quality	0.937
User Satisfaction	0.931

Based on these results, all variables in this study have a composite reliability value greater than 0.70. Therefore, it can be concluded that all variables exhibit good reliability and meet the required reliability standards.

e. Latent Variable Correlations

The latent variable correlation must be tested in order to ascertain the strength and direction of the relationship between variables [8]. The maximum correlation value between variables is 1, and the closer the value is to 1, the stronger the correlation (see Table 7).

Table 7. Latent Variable Correlation Result

	Y	X4	X3	X2	X1
Y	1.000				
X4	0.877	1.000			
X3	0.815	0.835	1.000		
X2	0.861	0.861	0.761	1.000	
X1	0.821	0.740	0.708	0.783	1.000

Based on these results, the average correlation between variables is relatively high, exceeding 0.6. The highest correlation occurs between the service quality variable (X4) and user satisfaction (Y), with a value of 0.877. This indicates that, among the variables in this research model, the relationship between service quality and user satisfaction is the strongest.

3.3 Structural Model Assessment (Inner Model)

Structural model assessment is conducted by examining the R-Square (R^2) value, which indicates the goodness-of-fit of the model. This assessment determines the extent to which the independent variables explain the dependent variable. Strong R^2 values exceed 0.67, moderate R^2 values range from 0.33-0.67, while weak R^2 values fall below 0.19 [10]. The following are the results of the structural model assessment (see Table 8).

Table 8. R-Square Test Results

Variable	R-Square	Description
User Satisfaction	0.854	Strong

Based on these results, it is known that the user satisfaction variable (KP) can be explained by the variables of perceived usefulness, system quality, information quality, and service quality by 85.4%. Thus, the model used in this study has a very good ability to measure user satisfaction.

3.4 Hypothesis Testing

Hypothesis testing is carried out using the bootstrapping method to evaluate and examine the impact between variables in the construct. The hypothesis is accepted if the t-statistics value is greater than the Z value $\alpha = 0.05$ (5%) = 1.96 [8] (see Table 9).

Table 9. Bootstrapping Results

	Hypothesis	T-Statistics	Original Sample
H1	Perceived Usefulness → User Satisfaction	2.903	0.274
H2	System Quality → User Satisfaction	1.957	0.227
H3	Information Quality → User Satisfaction	2.026	0.159
H4	Service Quality → User Satisfaction	3.582	0.346

These results indicate that:

a. **H_1** : Perceived usefulness positively impacts user satisfaction.

The test results indicate an original sample value of 0.274 and a t-statistic value of 2.903 (greater than 1.96). Therefore, it can be concluded that perceived usefulness positively impacts user satisfaction, so H_1 is **accepted**.

The results of this study align with the opinion of Setyowati and Respati (2017), who state that perceived usefulness affects user satisfaction by providing a sense of benefit and facilitating the completion of tasks quickly and easily [11]. The results are also consistent with the research of Rahayuningtyas (2022), which indicates that perceived usefulness has a significant positive impact on user satisfaction [12].

b. **H_2** : System quality positively impacts user satisfaction.

The test results show an original sample value of 0.227 and a t-statistic value of 1.957, which is rounded up to 1.96. This value meets the requirements for hypothesis acceptance. Therefore, it can be concluded that system quality positively impacts user satisfaction, so H_2 is **accepted**.

The results of this study align with the opinion of DeLone and McLean (2003), who state that system quality impacts individuals who use the system [4]. The results are also consistent with the research of Buana and Wirawati (2018), who found that information system quality has a significant positive impact on user satisfaction [13].

c. **H_3** : Information quality positively impacts user satisfaction.

The test results show an original sample value of 0.159 and a t-statistic value of 2.026 (greater than 1.96). Therefore, it can be concluded that information quality positively impacts user satisfaction, so H_3 is **accepted**.

The results of this study align with Sihotang's (2020) opinion that information quality affects user satisfaction [14]. The results are also consistent with the research of Satyadarma and Syamsudin (2023), who found that information quality positively impact user satisfaction [6].

d. **H_4** : Service quality positively impacts user satisfaction.

The test results show an original sample value of 0.346 and a t-statistic value of 3.582 (greater than 1.96). Therefore, it can be concluded that service quality positively impacts user satisfaction, so H_4 is **accepted**.

The results of this study align with DeLone and McLean's (2016) opinion that service quality influences user satisfaction [15]. The results are also consistent with the research of Muharsyah (2021), which states that service quality significantly impact user satisfaction [16].

3.5 Simultaneous Testing

Simultaneous testing is conducted using the F test to examine the impacts of the independent variables on the dependent variable collectively. This test is performed at a significance level of 5% (0.05), where an F significance value less than 0.05 indicates that the impacts of the independent variables on the dependent variable collectively [17] (see Table 10).

Table 10. Simultaneous Test Results

Model	Sum of Square	df	Mean Square	F	Sig
Regression	1531.947	4	382.987	17.498	.000
Residual	2407.584	110	21.887		
Total	3939.530	114			

Based on these results, it is known that the significance value shows 0.000 where the value is less than 0.05, which means that the variables of perceived usefulness, system quality, information quality, and service quality simultaneously impact information system user satisfaction. Therefore, **H_5** (perceived usefulness, system quality, information quality, and service quality simultaneously impact user satisfaction) is **accepted**.

CONCLUSION

Based on the results of research on the analysis of perceived usefulness, system quality, information quality, and service quality on user satisfaction with the UNESA SIDIA system, it can be concluded that the variables of perceived usefulness, system quality, information quality, and service quality positively impact user satisfaction of the UNESA SIDIA system. In addition, the variables of perceived usefulness, system quality, information quality, and service quality simultaneously impact the satisfaction of users of the UNESA SIDIA system.

ACKNOWLEDGEMENTS

Thanks to God Almighty for all the blessings that have been given, so that the author can complete this research. The author would like to thank the parents, family, supervisors, best friends, and all respondents who have been willing to provide information for research purposes.

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