

Analysis and Quality Measurement of SITEDI Sub-System Against User Satisfaction Using WebQual 4.0 and End-User Computing Satisfaction (EUCS) Methods

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ABSTRACT

One of the efforts in handling educational challenges in the era of technological development is the development of the Thesis Information System for Dissertation Thesis (SITEDI). SITEDI is an information system that facilitates the thesis administration process starting from the presentation of the subject matter to the final exam managed by Universitas Negeri Semarang (UNNES). Therefore, it is necessary to measure the quality of SITEDI performance based on user satisfaction to facilitate the evaluation process of SITEDI as a quality student service in the future. The research method used in this study is a combination of WebQual 4.0 and End-User Computing Satisfaction (EUCS). The variables used include usability quality, information quality, service interaction quality, format, and timeliness. The sample used was 135 respondents with purposive sampling technique. The results of the analysis that have been carried out conclude that simultaneously the variables of usability quality, information quality, service interaction quality, format, and timeliness have an influence on user satisfaction by 62.5%. WebQual 4.0 variables, namely service interaction quality, information quality, and usability quality sequentially have a significant influence on user satisfaction with an effect size of 0.092, 0.069, and 0.028. Meanwhile, the EUCS variables, namely format and timeliness, do not have a significant influence on user satisfaction.

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1 Introduction

Over the past decade, billions of people have been actively involved in technology development (Soler-Costa et al., 2021). Information technology is a device used by someone to process data, get information, and others (Munti & Syaifuddin, 2020). A more complex definition of information technology is the technology used to process data, including processing, collecting, organizing, storing, and manipulating data in various ways to produce quality information (Cholik, 2021). The development of information technology today has grown rapidly, one of which is through the internet media. Through the internet, common activities that previously had to be done face-to-face are now more efficient because they can be done online.

In addition, the internet is also known as a medium in the current era of digital technology development that has the potential to expand public space in obtaining information (Suta et al., 2019). The internet is one of the information technologies whose existence continues to grow from year to year (Susilawati et al., 2020). Among the many services provided by the internet, websites are one of the fastest means of communication to present object information to internet visitors. In the field of education in Indonesia, there is a need for institutions that support the development of the internet (Pratama et al., 2019). Therefore, a website or system with good quality is needed.

A good website or system can be seen from user-friendliness and effectiveness, content quality, good functionality, to ensure long-term success and growth. The combination of the above factors

will give an idea of the extent to which websites and systems are quality and effective in achieving their goals. One of the efforts to determine the quality of the website is to use the WebQual 4.0 and End-User Computing Satisfaction measurement methods. Webqual 4.0 is a technique for assessing the quality of a web page or system based on user views (Purwandani & Syamsiah, 2021). Meanwhile, End-User Computing Satisfaction (EUCS) is a method of measuring the satisfaction of application system users who are processed by comparing the expectations to be addressed and the reality that occurs from the information system (Indah Purwandani, 2018).

SITEDI (Sistem Informasi Skripsi Tesis Disertasi) is an information system that facilitates the thesis administration process starting from the presentation of the subject matter to the final exam managed by Universitas Negeri Semarang (UNNES). The performance of SITEDI currently requires special attention due to the migration process which also causes the user adaptation process, especially students. One solution to this is to measure the quality of the sub-system. Based on the explanation above, research is needed to determine the quality of SITEDI based on user perceptions, especially final semester students. This can facilitate the evaluation process of SITEDI in the future as one of the quality student facilities.

2 The Proposed Algorithm

Based on the explanation of the problems that exist in supporting this research, it is necessary to study the theory contained in this section to solve the problem in order to achieve the desired solution and results.

2.1 SEM-PLS

SEM (Structural Equation Model) is an analytical method that combines factor analysis and regression analysis (correlation), which aims to examine the relationship between variables of a model, between indicators and models, their structure, and the relationship between structures (Hair et al., 2021). Another definition of SEM is a statistical technique capable of analyzing the pattern of relationships between latent structures and their indices, latent structures between them, and measurement error directly. Basically, SEM is a multivariate technique that shows how to represent a sequence or set of causal relationships in a path diagram (Putlely et al., 2021). Meanwhile, PLS (Partial Least Square) is an SEM that uses components or variations as its basis. PLS is a variation-based statistical method, so there is never a matrix singularity problem (Prapcoyo et al., 2018). PLS is an SEM index that includes training and reflection variables (Prayitno et al., 2021). In addition, PLS can also measure conversion relationships in the form of training relationships that cannot be measured by SEM (Tedjo & Santoso, 2017).

2.2 WebQual 4.0

WebQual 4.0 is a research-based website quality measurement tool that uses a user perception approach and is classified into 3 variables, namely usability quality, information quality, and service interaction quality (Nurhadi et al., 2019). The usability quality aspect is based on the relationship or relationship between the user and the computer, the suitability of the design and the comfort provided to the user, while the information quality aspect pays more attention to the quality of the information available on the site, its updates, and the validity of the information available (Rusi, 2022). The service interaction quality aspect relates to the quality of website services perceived by users, such as access security, functional interaction on the website, and available online services.

2.3 End-User Computing Satisfaction (EUCS)

End User Computing Satisfaction (EUCS) is a method commonly used to measure user satisfaction with an information system based on user perceptions of the quality of the information system (Fitriantoro & Husnah, 2018). There are five dimensions evaluated in EUCS namely content, accuracy, format, ease of use, and timeliness.

2.4 Hypothesis

A hypothesis is a temporary question or assumption about a particular phenomenon being studied (Darwati & Fitriyani, 2022). This assumption is very helpful in helping researchers determine how

to think to arrive at research results. This hypothesis can also be called a question in the formula. There are 5 (five) hypotheses that will be tested in this study:

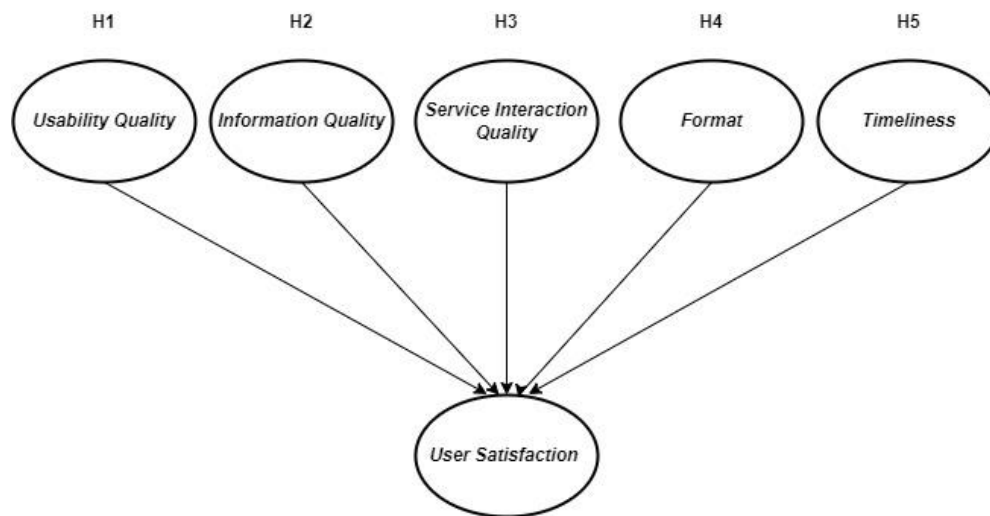


Figure 1. Hypothesis

- H1 = Usability Quality has a significant influence on User Satisfaction
- H2 = Information Quality has a significant influence on User Satisfaction
- H3 = Service Interaction Quality has a significant influence on User Satisfaction
- H4 = Format has a significant influence on User Satisfaction
- H5 = Timeliness has a significant influence on User Satisfaction

3 Method

The population used in this study were active users of SITEDI, which in this case were UNNES undergraduate students who were working on their final thesis. Based on considerations for using purposive sampling techniques and predetermined criteria, as well as in order to minimize invalid data during the data analysis process, the number of samples was determined to be 135 respondents in 8 faculties. This research uses a quantitative approach with a research flow that has been designed in Figure 2 below.

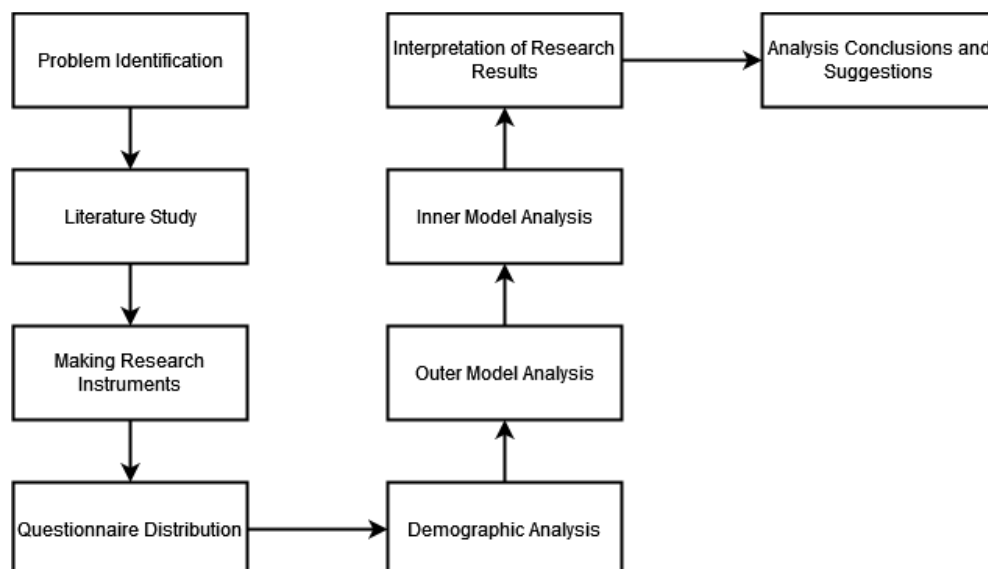


Figure 2. Research Design

3.1 Problem Identification

The process of identifying research problems is to find problems faced by research subjects in accordance with the research topic to be studied. The process starts from determining the research topic to uncovering the keywords that will be used for the case study in the problem definition process. Fundamentally, problem identification involves recognizing, comprehending, and elucidating the issues or difficulties that require attention. It forms the basis for creating remedies and arriving at informed choices.

3.2 Literature Study

Literature review is the process of studying, reviewing, and reviewing various documents, then recording them with Mendeley. In academic research papers, theses, and dissertations, a literature review is commonly incorporated within the introductory section. Its primary role is to establish a solid theoretical and empirical basis for the research, showcase a profound grasp of the subject matter, and provide rationale for the new research endeavor. Researchers typically undertake literature reviews by scouring academic databases, libraries, and pertinent sources to gather, structure, and evaluate the preexisting research pertaining to their selected topic.

3.3 Making Research Instruments

The research process used a questionnaire containing questions based on the respondent's identity and identified variables. This research instrument contains questions that are compiled based on predetermined variables. These instruments are designed to help researchers collect, measure and record data systematically and accurately. The selection of research instruments depends on the purpose of the research, the type of data required, and the research methodology.

3.4 Questionnaire Distribution

The process of distributing questionnaires is carried out to respondents with the aim of knowing how the respondents' views are based on the research tools that have been carried out through Google Forms. The questionnaire was distributed directly (face-to-face) with respondents and indirectly through social networks such as WhatsApp, Twitter and Telegram.

3.5 Demographic Analysis

The demographic analysis process is a research process that aims to classify the demographic characteristics of respondents who have filled out the questionnaire to make it more systematic. It involves the collection, interpretation and presentation of data related to specific demographic factors within a group of people. Demographic analysis typically involves collecting data through surveys, censuses, or other sources, followed by data processing and statistical analysis. Researchers use this information to identify patterns, trends, and correlations within a population, which can inform various decisions, policies, and strategies. The characteristics grouped in this process include name, gender, age, semester level of study, major of study, and duration in accessing SITEDI.

3.6 Outer Model Analysis

Outer model analysis is a model test analysis to determine the characteristics of the proposed research model with a number of tests, namely item reliability, composite reliability, average variance extracted (AVE), and discriminant validity (Ringle et al., 2018). The outer model defines the connections between a latent variable and the observable or measured variables associated with it.

3.7 Inner Model Analysis

Inner model analysis is a structural model analysis as an extension of the external model analysis with several concepts, namely path coefficient (β), coefficient of determination (R^2), t-test, effect size (f^2), predictive relevance (Q^2), and relative impact (q^2) (Hair et al., 2014). The inner model outlines the connections among hidden or latent variables.

3.8 Interpretation of Research Results

The process of interpreting the research results is carried out with the aim of forming a theoretical view of the research results obtained from data processing and analysis. It is intended to interpret the research findings in a way that is easily absorbed and learned by the reader and helps draw conclusions. Interpretation of research results is a complex undertaking that demands a blend of

careful evaluation, impartiality, and a profound comprehension of the research's context. This entails comprehending the significance of the results, grasping their ramifications, and dealing with the research inquiries or hypotheses.

3.9 Analysis Conclusions and Suggestions

The conclusion analysis process aims to form a conclusion or outline drawn from the entire research process to the results obtained. In addition, a conclusion analysis process was also conducted to form research objectives based on the results obtained. This is useful to help develop further research as strengths and weaknesses are also described in the process.

4 Results and Discussion

The results and discussion of the research conducted refer to the various research method processes outlined above.

4.1 Results and Discussion of Demographic Analysis

4.1.1 Gender

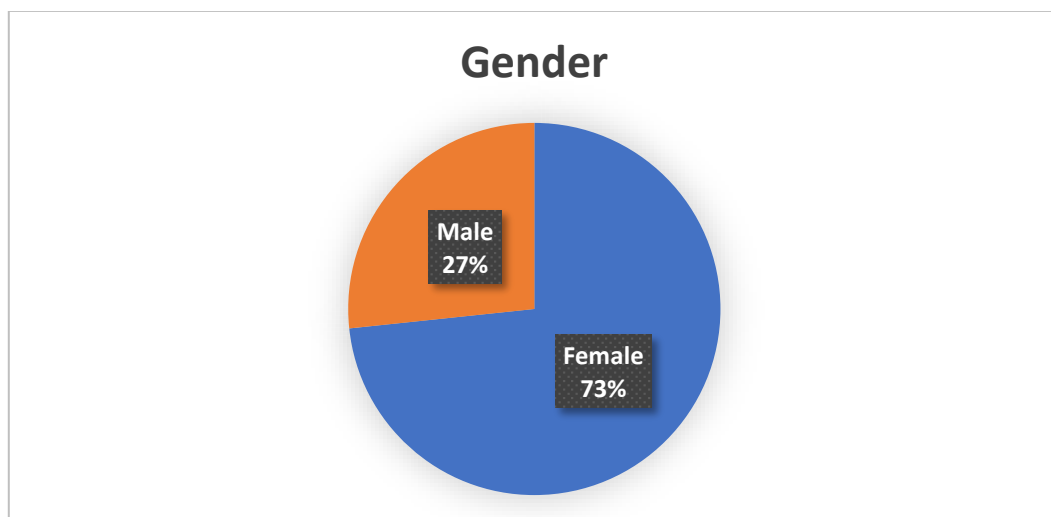


Figure 3. Percentage of Gender

In the results that have been obtained regarding the percentage of gender of students who filled out the research questionnaire, there are 27% male students and 73% female students. Based on the data collected through the questionnaire, there were 36 men and 99 female who took part in the survey in this study. Based on these results, it can be concluded that female students tend to be more active than male students who tend to be more passive in terms of taking the time to fill out research questionnaires.

4.1.2 Academic

The academic demographic in this study can be seen based on two things, namely the percentage of semester and the percentage of total guidance.

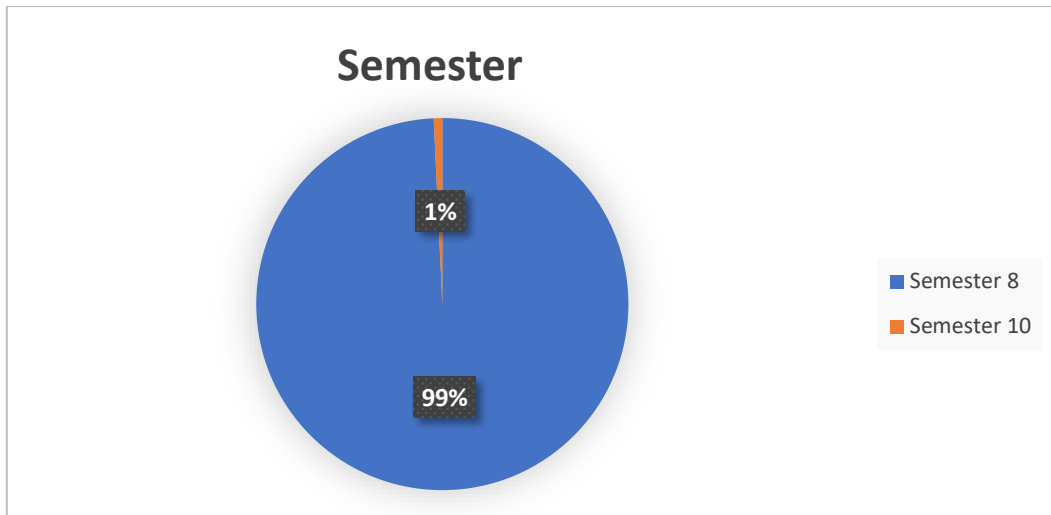


Figure 4. Percentage of Semester

In the results obtained in the demographic analysis of student semester levels, it can be concluded that 8th semester students dominate by 99% with a total of 134 respondents out of a total of 135 respondents in this study. Based on the results obtained, it can be assumed that 8th semester students tend to be more suitable in meeting the criteria of this study and are more active in using SITEDI.

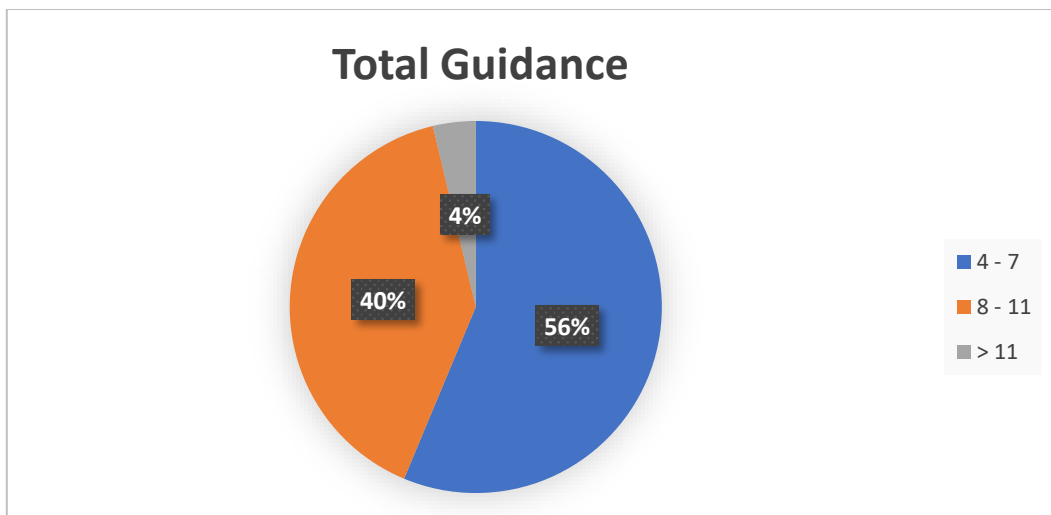


Figure 5. Percentage of Total Guidance

The results obtained in the analysis of the total student guidance show that students with a total guidance of 4-7 meetings obtained 56%, students with a total guidance of 8-10 meetings obtained 40%, while students with a total guidance of less than 11 meetings obtained 4%. Based on the results obtained, it can be assumed that the respondents involved in this study showed quite good productivity in the percentage of following thesis guidance.

4.1.3 Access Duration

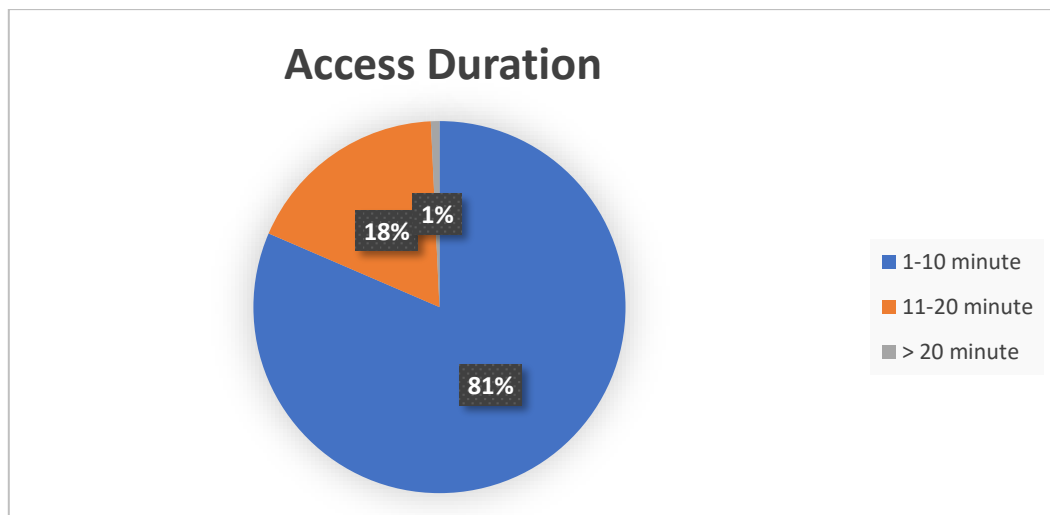


Figure 6. Percentage of Access Duration

The results obtained in the analysis of SITEDI access duration show that students take an average of about 1-10 minutes to access SITEDI. This is proven by the percentage obtained of 81%. Based on these results, it can be assumed that students do not take too long when using the features on SITEDI.

4.2 Results and Discussion of Outer Model Analysis

4.2.1 Item Reliability (Outer Loadings)

The outer loadings value must be above 0.7 to state that the indicators used in this study are valid. In Table 1, there are two indicators that were removed, namely the IQ2 indicator on the information quality variable and SI2 on the service interaction quality variable (Fornell & Larcker, 1981). This is because the two indicators do not meet the threshold requirements for the outer loadings value, which is above 0.7. After the removal of these indicators, the outer loadings value obtained in each indicator is above 0.7. This means that the indicators tested in this study are valid and can be continued to the next testing stage.

Table 1. Outer Loadings

	<i>Outer loadings</i>
FQ1 <- Format	0,893
FQ2 <- Format	0,804
FQ3 <- Format	0,902
FQ4 <- Format	0,795
IQ1 <- Information Quality	0,709
IQ3 <- Information Quality	0,839
IQ4 <- Information Quality	0,914
SI1 <- Service Interaction Quality	0,743
SI3 <- Service Interaction Quality	0,833
SI4 <- Service Interaction Quality	0,833
TQ1 <- Timeliness	0,836
TQ2 <- Timeliness	0,783
TQ3 <- Timeliness	0,833
TQ4 <- Timeliness	0,760
UQ1 <- Usability Quality	0,838

	<i>Outer loadings</i>
UQ2 <- Usability Quality	0,827
UQ3 <- Usability Quality	0,856
UQ4 <- Usability Quality	0,788
US1 <- User Satisfaction	0,704
US2 <- User Satisfaction	0,928
US3 <- User Satisfaction	0,860
US4 <- User Satisfaction	0,789

4.2.2 Composite Reliability

In Table 2, it can be seen that the composite reliability value of each variable used is above 0.7. This means that this study uses variables with a good, valid, and acceptable level of reliability. Then, the Cronbach's alpha value in each variable is also above 0.7.

Table 2. Composite Reliability

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Format	0,871	0,875	0,912
Information Quality	0,776	0,877	0,863
Service Interaction Quality	0,728	0,740	0,846
Timeliness	0,819	0,829	0,879
Usability Quality	0,848	0,860	0,897
User Satisfaction	0,839	0,849	0,894

4.2.3 Average Variance Extracted (AVE)

The AVE value that can state that the variable has good convergent validity is above 0.5. In Table 3, it can be seen that each variable tested has an AVE value above 0.5. This means that all AVE values in this case have met the test requirements.

Table 3. Average Variance Extracted (AVE)

Variable	Average variance extracted (AVE)
Format	0,722
Information Quality	0,681
Service Interaction Quality	0,647
Timeliness	0,646
Usability Quality	0,685
User Satisfaction	0,680

4.2.4 Discriminant Validity

Based on this, it can be seen in Table 4 where the value of each bolded indicator in each variable has a higher value than the other block constructs. This means that discriminant validity in this test is not found to be a problem and is acceptable. This is supported by the acquisition of AVE values which are also above 0.5 in Table 3.

Table 4. Cross Loadings

	<i>Format</i>	<i>Information Quality</i>	<i>Service Interaction Quality</i>	<i>Timeliness</i>	<i>Usability Quality</i>	<i>User Satisfaction</i>
FQ1	0,893	0,579	0,816	0,730	0,746	0,586
FQ2	0,804	0,625	0,710	0,687	0,700	0,680
FQ3	0,902	0,699	0,773	0,589	0,598	0,622
FQ4	0,795	0,665	0,570	0,559	0,563	0,543
IQ1	0,469	0,709	0,331	0,270	0,274	0,260
IQ3	0,555	0,839	0,406	0,452	0,473	0,514
IQ4	0,779	0,914	0,611	0,593	0,608	0,661
SI1	0,578	0,399	0,743	0,497	0,502	0,514
SI3	0,705	0,499	0,833	0,636	0,658	0,664
SI4	0,759	0,474	0,833	0,633	0,628	0,559
TQ1	0,572	0,327	0,594	0,836	0,833	0,495
TQ2	0,468	0,270	0,530	0,783	0,773	0,455
TQ3	0,748	0,619	0,692	0,833	0,818	0,652
TQ4	0,598	0,532	0,528	0,760	0,751	0,601
UQ1	0,567	0,343	0,586	0,836	0,838	0,495
UQ2	0,512	0,323	0,564	0,820	0,827	0,511
UQ3	0,792	0,653	0,740	0,844	0,856	0,695

	<i>Format</i>	<i>Information Quality</i>	<i>Service Interaction Quality</i>	<i>Timeliness</i>	<i>Usability Quality</i>	<i>User Satisfaction</i>
UQ4	0,628	0,546	0,553	0,772	0,788	0,633
US1	0,465	0,507	0,462	0,427	0,462	0,704
US2	0,619	0,494	0,630	0,629	0,654	0,928
US3	0,602	0,489	0,600	0,609	0,620	0,860
US4	0,668	0,585	0,677	0,615	0,615	0,789

4.2.5 *Final Result of Outer Model Analysis*

Based on the outer model testing stages that have been carried out above, including item reliability, composite reliability, average variance extracted (AVE), and discriminant validity, it can be concluded that the research model tested in Figure 7 has good characteristics and statistics. Therefore, the model can be continued to the next stage of testing, namely inner model analysis.

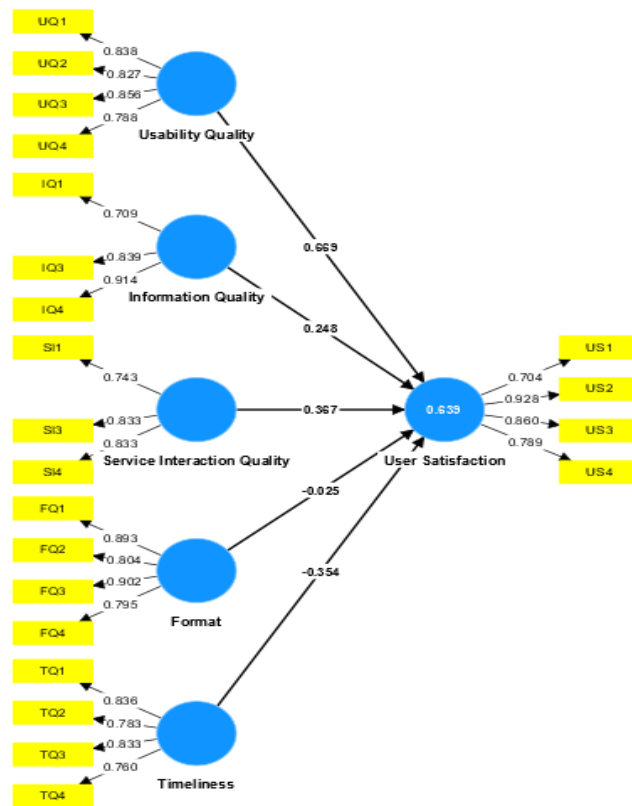


Figure 7. *Outer Model*

4.3 *Results and Discussion of Inner Model Analysis*

4.3.1 *Path Coefficient (β)*

The acceptable value in this test is above 0.1. Meanwhile, a value close to +1 indicates that the relationship between variables is positive and a value close to -1 indicates that the relationship between variables is negative (Sarstedt et al., 2017). Based on the results of Path Coefficient (β) testing in Table 5, it can be concluded that the relationship between the format variable and user satisfaction and the relationship between the timeliness variable and user satisfaction has a negative effect. Meanwhile, other variables have a positive influence on user satisfaction.

Table 5. Path Coefficient (β)

Relationship between Variables	Path coefficients
<i>Format</i> → <i>User Satisfaction</i>	-0,025
<i>Information Quality</i> → <i>User Satisfaction</i>	0,248
<i>Service Interaction Quality</i> → <i>User Satisfaction</i>	0,367
<i>Timeliness</i> → <i>User Satisfaction</i>	-0,354
<i>Usability Quality</i> → <i>User Satisfaction</i>	0,669

4.3.2 Coefficient of Determination (R^2)

Coefficient of determination (R^2) has a measurement standard which is divided into 3 (three) categories, namely 0.19 (weak), 0.33 (moderate), and 0.67 (strong). Based on the test results in Table 6, it can be concluded that the R^2 value of all exogenous variables jointly or simultaneously affects the endogenous variable of 0.639 with an adjusted R^2 value of 0.625. So, it can be explained that all exogenous variables simultaneously affect user satisfaction by 63.9%. Because the adjusted R^2 value obtained is 0.625, all exogenous variables affect user satisfaction by 62.5% and are moderate.

Table 6. Coefficient of Determination (R^2)

Variable	R-square	R-square adjusted
<i>User Satisfaction</i>	0,639	0,625

4.3.3 T-test

The t-test in the inner model analysis is used to test the proposed research hypothesis provided that the t-test value must be above 1.96. This test uses a two-tailed test with a significance level of 0.05 or 5% using the bootstrapping method. Based on the results of the t-test in Table 7, it can be concluded that the format and timeliness variables do not significantly affect user satisfaction. While other variables have a significant effect on user satisfaction.

Table 7. T-test

Relationship between Variables	T statistics
<i>Format</i> → <i>User Satisfaction</i>	0,195
<i>Information Quality</i> → <i>User Satisfaction</i>	3,200
<i>Service Interaction Quality</i> → <i>User Satisfaction</i>	2,554
<i>Timeliness</i> → <i>User Satisfaction</i>	1,397
<i>Usability Quality</i> → <i>User Satisfaction</i>	2,123

4.3.4 Effect Size (f^2)

The f^2 value in this test is measured using 3 categories, namely 0.02 (small), 0.15 (medium), and 0.35 (large). Then, f^2 values less than 0.02 are considered to have no effect and can be ignored. Based on the f^2 test results in Table 8, it can be concluded that there are two relationships that have no effect and can be ignored, namely the format variable \rightarrow user satisfaction with a value of 0.000 and the timeliness variable \rightarrow user satisfaction with a value of 0.008. Meanwhile, other variables have an effect with a small category.

Table 8. Effect Size (f^2)

No	Relationship between Variables		f^2	Category
1	Format	\rightarrow User Satisfaction	0,000	-
2	Information Quality	\rightarrow User Satisfaction	0,069	Small
3	Service Interaction Quality	\rightarrow User Satisfaction	0,092	Small
4	Timeliness	\rightarrow User Satisfaction	0,008	-
5	Usability Quality	\rightarrow User Satisfaction	0,028	Small

4.3.5 Predictive Relevance (Q^2)

Predictive relevance (Q^2) in inner model analysis aims to prove that the variables in the model have a predictive relationship with other variables. The requirement in this test is that the Q^2 value must be above 0 (zero) and tested using the PLSpredict (CVPAT) method. In Table 9, it can be concluded that the model in the study has a predictive relationship with a value of 0.574 or 57.4%.

Table 9. Predictive relevance (Q^2)

Variabel	$Q^2_{predict}$
User Satisfaction	0,574

4.3.6 Relative Impact (q^2)

The measurement standards in this test are divided into 3 categories, namely 0.02 (small), 0.15 (medium), and 0.35 (large). This test uses PLSpredict (CVPAT). Based on the test results in Table 10, it can be concluded that each variable indicator tested has a large influence with values (0.755), (0.368), and (0.434). While other variable indicators have a medium category influence with a value of 0.230.

Table 10. Relative Impact (q^2)

No		q^2			Category
		Q^2_{-in}	Q^2_{-ex}	Σq^2	
1	US1	0,574	0,252	0,755	Large
2	US2	0,574	0,417	0,368	Large
3	US3	0,574	0,389	0,434	Large
4	US4	0,574	0,476	0,230	Medium

4.3.7 Final Result Inner Model Analysis

The proposed research model has gone through a series of inner model analysis stages including Path Coefficient (β), Coefficient of Determination (R^2), T-test, Effect Size (f^2), Predictive Relevance (Q^2), and Relative Impact (q^2). A series of testing stages certainly greatly affect the conclusions that researchers will draw. This can be seen in Figure 8 to see the final result of the research model.

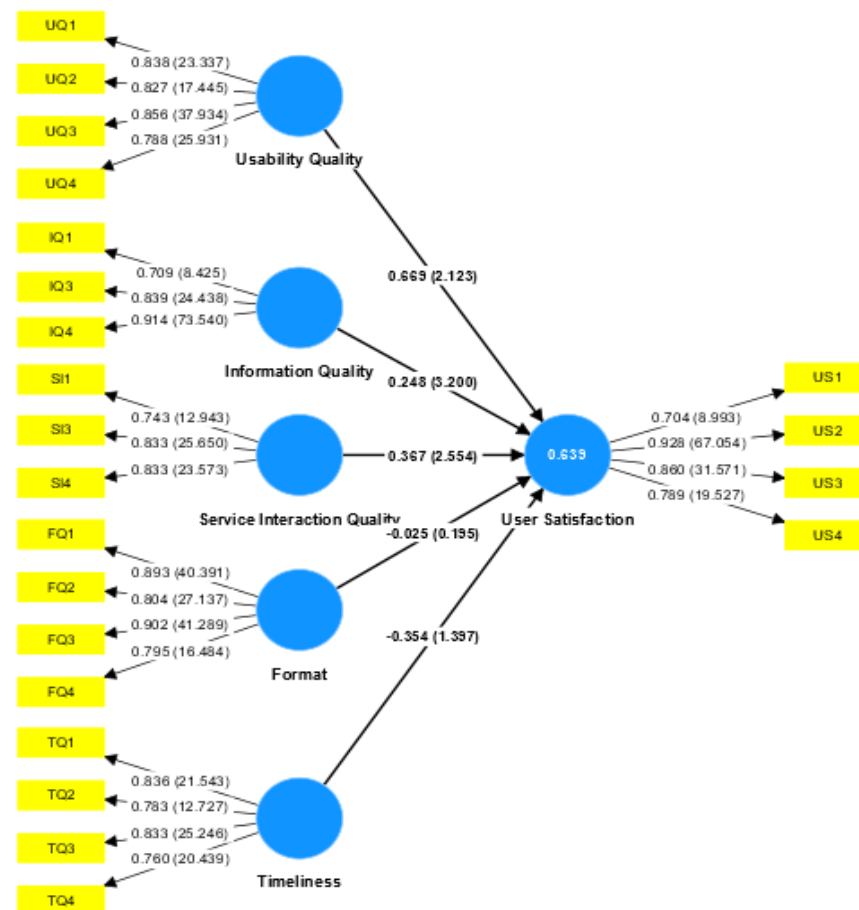


Figure 8. Inner Model

5 Conclusion

Based on the results of the inner model analysis that has been carried out, it can be concluded that simultaneously the usability quality, information quality, service interaction quality, format, and timeliness variables have an influence on user satisfaction by 62.5%. There are three variables, namely usability quality, information quality, and service interaction quality that have a significant and positive influence on user satisfaction. Meanwhile, other variables such as format and timeliness do not have a significant influence on user satisfaction. Factors that play a role in influencing the quality of SITEDI in terms of user satisfaction in order from the largest are service interaction quality with an effect size of 0.092, information quality with an effect size of 0.069, and usability quality with an effect size of 0.028. The service interaction quality factor has the largest effect size on user satisfaction and of course this also affects the quality of SITEDI. This can happen because service interaction quality is a factor to measure the quality of service interaction between users and SITEDI. Therefore, to be able to improve the quality of SITEDI, it should be able to maximize the service interaction quality factor, for example by improving the interaction quality of SITEDI's supporting features.

6 References

- Cholik, C. A. (2021). Perkembangan Teknologi Informasi Komunikasi/ICT dalam Berbagai Bidang. *Jurnal Fakultas Teknik*, 2(2), 39–46.
- Darwati, L., & Fitriyani. (2022). Analisis Pengukuran Tingkat Kepuasan Pengguna Aplikasi Ovo Menggunakan Metode End User Computing Satisfaction (Eucs). *JUST IT : Jurnal Sistem Informasi, Teknologi Informasi Dan Komputer*, 12(2), 34–42.
- Fitriantoro, M. J., & Husnah, N. (2018). *The Implementation of the End-User Computing Satisfaction Model into SCell: A Study of the Undergraduate Program of the Accounting Department in Universitas Indonesia*. 55(Iac 2017), 151–155.
- Fornell, C., & Larcker, D. F. (1981). *Evaluating Structural Equation Models with Unobservable Variables and Measurement Error*. 18(1), 39–50.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *An Introduction to Structural Equation Modeling. In: Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*. Classroom Companion: Business. Springer, Cham.
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121.
- Indah Purwandani. (2018). Analisa Tingkat Kepuasan Pengguna Elearning Menggunakan EUCS dan Model Delone and McLean. *IJSE – Indonesian Journal on Software Engineering Implementasi*, 4(2), 6–13.
- Munti, N. Y. S., & Syaifuddin, D. A. (2020). Analisa Dampak Perkembangan Teknologi Informasi Dan Komunikasi Dalam Bidang Pendidikan. *Jurnal Pendidikan Tambusai*, 4(2), 1799–1805.
- Nurhadi, A., Yunita, N., Mukhayaroh, A., & Sahirudin, A. (2019). Implementation Of Webqual 4.0 For Measuring The Quality Of Baznas.Go.Id Website For User Satisfaction. *Sinkron*, 3(2), 260.
- Prapcoyo, H., As'ad, M., & Kodong, F. R. (2018). Analisis Penerimaan Dan Kepuasan Pengguna Web Upnyk Bagi Mahasiswa Sistem Informasi Semester 1-4 Menggunakan Technology Acceptance Model (Tam) Dan Partial Least Square (Pls). *Seminar Nasional Informatika 2018*, 2018(November), 213–222.
- Pratama, A. R., Taufik, M. Y., & Hariyudin, A. (2019). The Influence of Internet Technology on The Development of Teaching and Learning Methods for Students. *PROJECT (Professional Journal of English Education)*, 2(6), 919–923.
- Prayitno, G., Ahari, M. I., & Rukmi, W. I. (2021). Structural Equation Model with Partial Least Square (SEM-PLS) of Place Dependence with Land Used Change. *Journal of International Studies*, 14(1), 153–171.
- Purwandani, I., & Syamsiah, N. O. (2021). Analisis Kualitas Website Menggunakan Metode Webqual 4.0 Studi Kasus: MyBest E-learning System UBSI. *Jurnal Sistem Dan Teknologi Informasi (Justin)*, 9(3), 300.
- Putlely, Z., Lesnussa, Y. A., Wattimena, A. Z., & Matdoan, M. Y. (2021). Structural Equation Modeling (SEM) untuk Mengukur Pengaruh Pelayanan, Harga, dan Keselamatan terhadap Tingkat Kepuasan Pengguna Jasa Angkutan Umum Selama Pandemi Covid-19 di Kota Ambon. *Indonesian Journal of Applied Statistics*, 4(1), 1.
- Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2018). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management*, 1–27.
- Rusi, I. (2022). Implementasi Webqual dan End-User Computing Satisfaction untuk Menganalisis Kualitas dan Kepuasan Pengguna Website. *Jurnal SISFOKOM (Sistem Informasi Dan Komputer)*, 11(2), 154–161.
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). *Partial Least Squares Structural Equation Modeling* (Issue September).
- Soler-Costa, R., Lafarga-Ostáriz, P., Mauri-Medrano, M., & Moreno-Guerrero, A. J. (2021). Netiquette: Ethic, education, and behavior on internet—a systematic literature review. *International Journal of Environmental Research and Public Health*, 18(3), 1–15.

-
- Susilawati, T., Yuliansyah, F., Romzi, M., & Aryani, R. (2020). Membangun Website Toko Online Pempek Nthree Menggunakan Php Dan Mysql. *Jurnal Teknik Informatika Mahakarya (JTIM)*, 3(1), 35–44.
- Suta, P., Dharma, A., Wiharta, D. M., & Saputra, K. O. (2019). Design Implementation of Search Engine Optimization (SEO) in MSMEs. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, 4, 8115–8123.
- Tedjo, M., & Santoso, R. (2017). Analisis Faktor-Faktor Yang Mempengaruhi Keputusan Penggunaan Transportasi Pribadi Pada Mahasiswa Menggunakan Pendekatan Partial Least Square (Studi Kasus pada Universitas Diponegoro Semarang). *Jurnal Gaussian*, 6(2), 211–219.