

Analysis of the Usage of the University of Medan Area (UMA) Library Repository Using the System Usability Scale (SUS) Method

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ABSTRACT

The purpose of this research is to assess the level of usage of the University of Medan Area Library's Repository System using the System Usability Scale (SUS) method. Librarians and students from the University of Medan Area, totaling 50 respondents, were selected as the research subjects. This study involved testing through validity and reliability tests, as well as analyzing the SUS method. The research results indicate that based on the analysis of data from the questionnaire testing results using the SUS method, in terms of Acceptability, Grade Scale, and Adjective Rating, the obtained results show that the range of user acceptability towards the University of Medan Area Library's Repository website falls within the Marginal High grade. The Grade Scale level falls into the D category, and the Adjective Rating level falls into the OK category, which is almost approaching Good. This suggests that the usage of the University of Medan Area Library's Repository with the SUS method has been successful. Additionally, it can be inferred that the SUS method has a positive influence on system usage. This is supported by the increase in the SUS score by 65 points, leading to the conclusion that the University of Medan Area Library's Repository website still needs to be evaluated and further developed to optimize its usage.

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1. INTRODUCTION

A Digital Library is a system that encompasses various services and information resources, facilitating access to these objects through digital devices. The purpose of this service is to enhance the efficiency, accuracy, and precision of retrieving information within the digital collection, which consists of various informational items, including documents, photos, and databases. A college or university library refers to the library within a university, as well as its affiliated institutions and bodies. These libraries primarily aim to support the goals and objectives of the respective higher education institutions[1]. The University of Medan Area (UMA) Library introduces digital applications annually,

including the Library Automation System commonly referred to as OPAC - Online Public Access Catalog (2017), Institutional Repository (2018), Integration Portal Library Smartlib (2019), and the Management Online Deposit Information System known as MODIS (2019).

An Institutional Repository refers to an entity engaged in the acquisition and preservation of digital content resulting from intellectual efforts.[2]. The presence of Institutional Repositories serves as a reliable measure for assessing the quality of a university, thereby encouraging many university libraries to adopt this approach. The effective utilization of International Relations (IR) can enhance visibility, reputation, and public value[3]. IR in higher education serves as a vital information processing unit that plays a crucial role in disseminating information effectively and advancing knowledge. The primary goal of this unit is to promote information dissemination and knowledge advancement[4]. Moreover, the presence of repositories facilitates rapid and easy knowledge transmission, benefiting unlimited library users. The components of an IR include: a) Established institution, b) Knowledge-based content, c) Interoperability and open access. d) The cumulative nature of this phenomenon allows for sustained utilization over a long period[5].

The Institutional Repository (IR) plays a significant role in facilitating the dissemination and accessibility of scholarly knowledge, particularly in addressing challenges related to visibility, information management, and access. Its importance has grown further due to scholarly information becoming a valuable resource for developing countries, resulting in disparities in knowledge acquisition.[6]. The primary purpose of this institution is to allocate funds for investment purposes. The main objective of the Institutional Repository is to collect, preserve, and facilitate access to scholarly works produced by the institution. The primary objectives of the established Institutional Repository go beyond the three aspects mentioned above, encompassing additional goals to fulfill various specific tasks related to enhancing the quality of scholarly works and strengthening the institution's global standing [7]. The primary focus of the Institutional Repository is to prioritize the transmission of digital data and information managed by library institutions through internet-based platforms. Digital data sources refer to the process of converting analog or physical media, such as books, journal articles, images, artworks, and microfilm, into electronic formats using techniques like scanning and related procedures[8].

The System Usability Scale (SUS) is a tool for evaluating usability that provides satisfactory results while considering factors such as limited sample size, time constraints, and cost considerations. Results obtained through the System Usability Scale (SUS) approach will be transformed into numerical scores. These scores can then serve as one of the factors in determining the feasibility of implementing an application[9].

The utilization of the System Usability Scale (SUS) has been employed to assess the extent of user experience and the likelihood that consumers will provide higher SUS scores when interacting with a product, such as a website[10]. The findings of this research indicate

that individuals with more experience in using websites tend to exhibit higher and more favorable System Usability Scale (SUS) scores compared to those with less experience[11].

The upcoming study involves the implementation of an experiment in which researchers administer treatment to a sample using the System Usability Scale (SUS) developed by John Brooke. The proposed intervention includes adding statements with supporting rationales, derived from Nielsen's usability principles. This research is motivated by the researcher's interest in exploring the potential cause-and-effect relationship between untreated SUS and treated SUS[12]. The researchers hypothesize that there will be a substantial difference in the outcomes obtained between the group subjected to the SUS method treatment and the group not subjected to the SUS method treatment. The rationale behind this can be linked to the collective perception of individuals when encountering each statement[13].

The researchers gained support for each argument by utilizing the five usability characteristics of Nielsen and then linking them to each statement made by John Brooke. As a result, the understanding of these statements will be facilitated for users, leading to a shared comprehension of the (SUS) methodology. Speaking about the usability aspects of a product or service, there are several quality attributes within the product or service that must be fulfilled and maintained. In terms of usability dimensions, they should encompass three quality aspects as follows: 1) Effectiveness, indicating the level of accuracy and completeness users achieve when performing specific tasks. 2) Efficiency, which demonstrates the resources used in relation to the accuracy and completeness achieved by users when completing tasks. 3) Satisfaction, reflecting the state where users feel free from discomfort and exhibit a positive response to the use of the system[14].

Although the ISO 9241-11 guideline has become a standard among usability experts, there are 5 usability attributes proposed based on the evaluation of website usability, namely: 1) Learnability, measuring the extent to which users can easily understand how to use the website for basic tasks the first time they use it. 2) Efficiency, measuring how quickly users can complete tasks after mastering the website. 3) Memorability, measuring the extent to which users can easily use the website correctly after not using it for an extended period. 4) Errors, measuring how many mistakes users make and how easily they can correct these mistakes. 5) Satisfaction, measuring how satisfied users are when using the website[15].

The research conducted by Listiyah[16]. The successful implementation of the SUS approach and Discovery Prototyping in the usability testing conducted at the Institutional Repository Library of UIN Maulana Malik Ibrahim Malang demonstrates its effectiveness. Furthermore, it is proven that the System Usability Scale (SUS) technique and the creation of discovery prototypes have a beneficial impact on usability metrics. Additionally, this research is expected to be further developed by incorporating recommendations from scholars. For instance, exploring other methodologies for SUS and discovery prototype creation could be considered to facilitate comparisons and enhance research outcomes.

Another study related to the SUS model by Aprilia [17] Evaluation of a website can begin with the use of usability measurements. The SUS score of the Tegal City Government website, which is 61.33, indicates that the current usability of the website is inadequate. This suboptimal usability can lead to users becoming deductors, potentially resulting in a decrease in user numbers. This can be demonstrated as a diagnostic indication, necessitating the use of alternative assessment methodologies for issue identification.

Table 1. The relationship of John Brooke's statement with Nielsen's usability

No.	Statement by John Brooke	Learnability	Efficiency	Memorability	Errors	Satisfaction
1.	I am considering using this Repository system again.	Yes	Yes	Yes	-	Yes
2.	I feel that this Repository system is very user-friendly.	Yes	Yes	Yes	-	-
3.	I feel that having the Repository system gives me unlimited access and I no longer need to physically go to the Library.	Yes	Yes	Yes	-	Yes
4.	I feel that the features of this Repository system work as they should.	Yes	Yes	Yes	-	-
5.	I need the assistance of a Librarian to use this Repository system.	-	-	-	Yes	-
6.	I feel that there are no obstacles in using this Repository system.	Yes	Yes	Yes	-	Yes
7.	I need to read the steps beforehand before using the Repository system.	-	-	-	Yes	-
8.	I feel that there is nothing complicated in conducting book and scholarly work searches within the Repository system.	Yes	Yes	Yes	-	Yes
9.	I feel that there is nothing complicated in accessing OJS (Open Journal System) within the Repository.	Yes	Yes	Yes	-	Yes
10.	I should check the quota first before using this Repository system.	Yes	Yes	Yes	-	Yes

The assessment method in the System Usability Scale (SUS) is outlined as follows: 1) The scale from strongly agree to strongly disagree is rated from 1 to 5. 2) For statements with odd numbers: subtract 1 from the user's response. 3) For statements with even numbers: subtract the user's response from 5. 4) Sum up the adjusted responses, then multiply by 2.5. This calculation result will transform the score range to between 0-100 [18].

In this study, the range of assessment results used is as follows: 1) Unacceptable Category for a score range of 00-64, 2) Acceptable Category for a score range of 65-84, and 3) Perfect Category for a score range of 85-100.

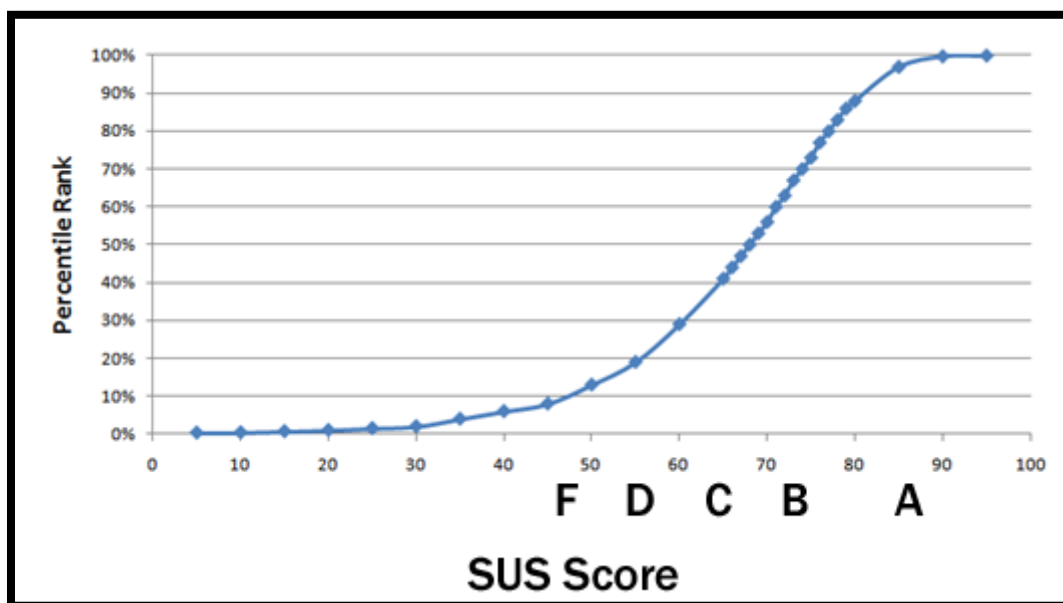


Figure 1. The Relationship of Percentile Rank with SUS Scores and Letter Grades

The difference between this research and the previous one is that the previous study focused on the Institutional Repository Library at UIN Maulana Ibrahim Malang by Listiyah, while in the case of Aprilia, the subject was the website of the Tegal City Government. In this current research, the object of study is the Repository of the Library at Universitas Medan Area (UMA).

The purpose of this scientific article is to assess the usability of the Medan Area Library (UMA) website for its users. The evaluation aims to determine whether further improvements are necessary based on the obtained results. Additionally, this research aims to compare the usability measurement results using the System Usability Scale (SUS) method with those obtained through Nielsen's usability evaluation. The contribution of this research lies in the refinement of previous studies, with a specific focus on using the System Usability Scale (SUS). The use of Quota Sampling allows for the collection of relevant.

2. RESEARCH METHOD

The data collection process was carried out by distributing questionnaires to a non-random sample of respondents. The data collection process involved a series of statements given to a sample of 50 respondents. The approach used was Quota Sampling, a type of sampling where the researcher determines the desired number of respondents to be

included in the study and then selects individuals to be sampled based on their characteristics: a) a total sample size of 50 people, b) 14% (7 people) affiliated with the Librarian group, while the remaining 86% (43 people) belonged to the Student group, c) the determination of these percentages was a subjective assessment made by the researcher based on their understanding of potential responses.

Validity and reliability assessment of the questionnaire were conducted using the Cronbach's Alpha statistical test method. The data obtained from the survey were collected and analyzed using Microsoft Excel spreadsheet software. The System Usability Scale (SUS) methodology was used for data processing. Reliability testing was performed to evaluate the questionnaire's level of trustworthiness used by the researcher, ensuring its reliability. Although the same questionnaire was used repeatedly in the study, this practice continued [19].

The use of a sample of 50 people is justified by the need to enhance the effectiveness of the research and to potentially generalize the findings to the entire population, which has been selected based on predetermined characteristics. Therefore, with a sample size of 50 people, it is considered relatively adequate to obtain the necessary data that is estimated to be reflective of the population. It is not feasible to calculate the exact proportion of the population when the sample size is not known precisely.

3. RESULTS AND DISCUSSION

3.1. Research Findings

The researcher evaluated the usability of the University of Medan Area (UMA) Library website using the System Usability Scale (SUS) approach. The assessment took place from May 6, 2023, to May 19, 2023, involving 50 participants who completed the SUS questionnaire known for its association with Nielsen's usability. Respondents had the flexibility to access the UMA website from anywhere, as long as internet connectivity was available. Users accessed the UMA Site using the URL <http://www.repository.uma.ac.id>, where they proceeded to explore various functions and engage in transactional activities. Subsequently, users provided responses to statements on the System Usability Scale (SUS), considering the specified guidelines outlined in the questionnaire. Respondent selection was carried out through a non-random sampling method that was specifically internal to UMA website users. The next section presents the profiles of the participants.

Table 2. Respondent Profile

Respondent Occupations	Quantity
Librarian	7
Student/Library User	43
Total	50

3.2. Validity Test

The validity assessment was conducted using the Statistical Package for the Social Sciences (SPSS) software on the responses obtained from a sample of 50 participants. Table 3 provides a summary of the results obtained from the validity test.

Table 3. Summary of Validity Test Results

	R_{value}	R_{table}	Explanation
Q1	0,215	0,278	Not Valid
Q2	0,364	0,278	Valid
Q3	0,271	0,278	Not Valid
Q4	0,528	0,278	Valid
Q5	0,653	0,278	Valid
Q6	0,323	0,278	Valid
Q7	0,330	0,278	Valid
Q8	0,407	0,278	Valid
Q9	0,458	0,278	Valid
Q10	1	0,278	Valid

The validity test is conducted using the Pearson correlation coefficient with a two-tailed hypothesis and a significance level of 5%. For the results to be considered genuine, the calculated value (R-value) must exceed the threshold table value (R-table) set at 0.278. Based on the findings presented in Table 3, the analysis of the 10 questionnaire items indicates that 8 of them have R-values exceeding the threshold value (R-table), demonstrating their validity. Conversely, the other 2 questionnaire items have R-values below the threshold (R-table), rendering them invalid.

3.3. Reliability Test

The reliability test using Cronbach's Alpha is considered reliable if the resulting value exceeds 0.7. Table 4 displays the reliability test conducted on the results obtained from (SPSS). The findings indicate that the Cronbach's Alpha coefficient for the 10 items in the questionnaire is 0.900, surpassing the threshold of 0.7, thereby strengthening the questionnaire's reliability.

Table 4. Reliability Test Results

Alfa Cronbach	Total Number of Items	Explanation
0,900	10	Reliabel

3.4. Analysis Of SUS Scores

The SUS score is obtained by applying the predetermined formula to the collected questionnaire data. Each statement item is given a contribution score. The contribution score for each item will vary between 0 and 4. Contribution scores for items 1, 3, 5, 7, and 9 are calculated by subtracting 1 from the scale position. Contribution scores for items 2, 4, 6, 8, and 10 are calculated by subtracting the scale position from 5. To obtain the overall system usability score, the total contribution score needs to be multiplied by a factor of 2.5. This consists of a questionnaire with 10 items, each rated on a 5-point Likert scale. The total SUS score ranges from 0 to 100, and higher scores indicate better usability[20].

Here is the formula for calculating the SUS score:

$$\text{Skor SUS} = ((Q1 - 1) + (5 - Q2) + (Q3 - 1) + (5 - Q4) + (Q5 - 1) + (Q6 - 1) + (Q7 - 1) + (5 - Q8) + (5 - Q9) + (5 - Q10)) * 2.5$$

The overall score of the System Usability Scale (SUS) is calculated by taking the average of individual scores from each user. The assessed SUS scores are presented in Table 5 as the outcome of the SUS score calculation.

Table 5. Calculation Results of Sus Scores

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS Scores
1	5	4	5	4	3	3	3	4	4	2	52,5
2	5	4	5	5	4	4	4	4	5	5	62,5
3	5	5	3	4	4	4	5	5	5	5	72,5
4	2	2	2	2	2	2	2	2	2	2	75
5	5	5	5	4	4	5	5	5	4	5	77,5
6	4	4	4	4	3	3	4	3	3	3	37,5
7	5	5	5	5	5	4	4	5	5	5	85
8	4	3	5	4	5	1	5	2	2	5	65
9	5	4	4	5	4	3	5	5	4	3	60
10	5	5	4	5	4	5	5	5	4	5	77,5
11	4	4	4	4	5	5	4	4	5	5	55
12	4	4	4	4	4	4	4	4	4	4	25
13	5	5	5	5	5	5	5	5	5	5	100
14	5	4	3	4	4	4	4	4	4	4	35
15	5	5	5	5	5	5	5	5	5	5	100
16	5	5	4	5	4	4	5	5	4	4	62,5
17	3	2	3	2	1	3	5	3	1	3	50
18	5	5	5	5	5	5	5	5	5	5	100
19	5	5	1	5	5	5	5	5	5	5	90
20	3	4	5	5	5	5	5	5	5	5	87,5
21	4	5	5	5	2	5	1	5	5	3	75
22	4	4	4	4	3	4	4	4	3	1	27,5
23	5	5	5	5	5	5	5	5	5	5	100
24	4	4	4	4	4	4	4	3	3	3	32,5
25	3	3	3	3	3	3	3	3	3	3	50
26	4	3	3	3	3	3	3	3	3	3	47,5
27	4	5	4	5	4	5	4	5	3	5	65

28	5	5	5	5	5	5	5	5	5	5	100
29	5	5	5	5	5	5	5	5	5	5	100
30	3	4	3	4	4	4	4	4	4	4	30
31	5	5	4	4	3	5	5	3	4	1	57,5
32	4	4	3	3	3	3	4	3	3	3	42,5
33	3	4	4	4	2	2	4	3	2	5	52,5
34	4	4	5	4	4	5	5	3	3	4	52,5
35	5	5	4	5	4	5	4	5	5	5	77,5
36	5	5	4	4	3	5	5	5	4	2	70
37	5	5	5	5	3	5	5	5	4	5	87,5
38	4	4	4	4	4	4	4	4	4	4	52
39	5	4	5	4	3	4	5	5	3	3	62,5
40	5	5	5	5	5	4	5	5	5	4	85
41	4	4	4	4	4	4	4	4	4	4	25
42	5	5	5	5	5	5	5	5	5	5	100
43	4	5	4	5	4	5	4	5	4	5	62,5
44	4	4	5	5	4	4	5	5	4	4	55
45	4	5	5	4	5	5	5	4	4	5	70
46	3	3	5	4	3	5	3	4	3	4	52,5
47	4	3	4	4	4	3	4	4	5	5	45
48	4	4	4	4	4	4	4	4	4	4	25
49	4	4	4	4	5	5	3	3	4	5	52,5
50	4	4	4	4	4	4	4	4	4	4	25
Average SUS Score											65

From the table above, it can be seen that the average value of the System Usability Scale (SUS) is 65.

The assessment of the 50 participants resulted in a cumulative System Usability Scale (SUS) score of 3250, with an average score of 65. Once the conclusive results of the respondent evaluation were obtained, the next step is to ensure the assessment of the evaluation results through the utilization of two appropriate methodologies. The determination of the first value is based on user agreement using the Acceptability, Grade Scale, Adjective Rating methodology. The purpose of this study is to ascertain the percentile range (SUS Score) of determining the Grade II value, assessed using the rating categories A, B, C, D, E, and F[21]. From both of these assessment calculation methods, the following results are obtained:

In order to ascertain users' perspectives on the University of Medan Area Library repository website, an assessment is necessary using the Acceptability Level, Grade Scale, and Adjective Rating by comparing the average assessment results of the 65 respondents. The findings of this research involve participants' assessments related to the Acceptability Table, Value Scale, and Adjective Rating, as presented in Figure 2:

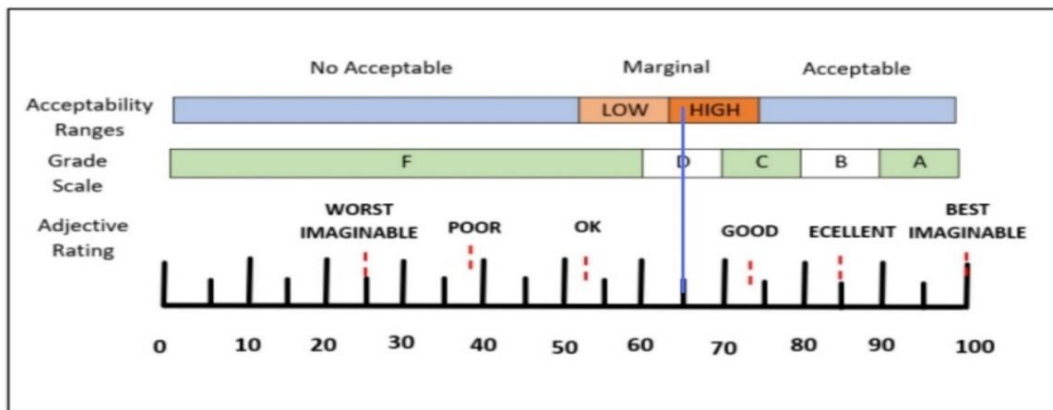


Figure 2. Determination of Assessment Results using Acceptability, Grade Scale, and Adjective Rating

Based on the findings presented in Figure 2, the assessment results indicate the following: 1) The level of user acceptability range towards the University of Medan Area Library repository website falls within the Marginal High category. 2) The user Scale Value level on the University of Medan Area Library repository website is classified as category D. 3) The user Adjective Rank level on the University of Medan Area Library repository website is categorized as OK. Following the assessment guidelines using the SUS Score Percentile Rank outcome, it can be concluded that the University of Medan Area Library repository website, with an average SUS score of 65, falls into the D grade category. This indicates the need for further evaluation and development of the University of Medan Area Library repository website.

Based on the research findings, the practical implications of this study are that the results can be used as feedback for the University of Medan Area Library's repository website to enhance its quality through further evaluation and improvements. This can help demonstrate the usability of the University of Medan Area Library's repository website when combined with the System Usability Scale technique, making it easier for students to use. As a practical recommendation based on the research results, the implementation of the System Usability Scale in the University of Medan Area Library's repository can enhance its usefulness for students.

4. CONCLUSION

Based on the data analysis of the questionnaire testing using the System Usability Scale (SUS) method, it was found that the user acceptability level towards the University of Medan Area Library repository website is in the category of Marginal High. Additionally, the scale level is categorized as D, and the adjective rating level is classified as OK. This

observation indicates that the utilization of the University of Medan Area Library Repository, combined with the SUS technique, has yielded positive results. Moreover, it is evident that the System Usability Scale (SUS) technique has a beneficial impact on the utilization of a system. This assertion is supported by the observed increase in the System Usability Scale (SUS) score by 65. Therefore, it can be concluded that further evaluation and refinement are needed for the University of Medan Area Library repository website to enhance its overall performance and optimize its usability.

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