

# An Important Aspect of Satisfaction on Mobile Apps: An Usability Evaluation Based on Gender

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## Abstract

The quality of the feasibility of a mobile application can be measured by evaluating the usability using certain testing methods. The refore to improve the performance of mobile applications, it is necessary to measure the level of satisfaction and user acceptance of the application. This study aims to improve the quality of the Myelkonsel mobile application by measuring the level of satisfaction and acceptance of end-users and evaluating the relationship between the level of user satisfaction with user gender differences using the System Usability Scale (SUS) method. Data collection was carried out by distributing questionnaires to 46 Telkonsel provider users consisting of 22 male users and 24 female users. The results showed that the average SUS score was 71.96 for the whole user. According to the calculation of the level of user acceptance included in the category of Acceptable, the scale of the class level is included in category C, and the ranking is included in the good category. While the results of calculations from the SUS Percentile Rank Score show that the MyTelkonsel mobile application is in class C. There are no significant differences according to gender, the average SUS score of the male is 71.93, and female is 71.98 so that gender differences do not affect the level of satisfaction and acceptance application. It can be seen that the level of end-user satisfaction from the MyTelkonsel mobile application is good but still has possible problems with its use.

*Keywords:* Usability evaluation, system usability scale (SUS), user satisfaction, mobile application.

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## 1. Introduction

In the field of Human-Computer Interaction, the term usability evaluation is known as one of the methods of evaluating system quality. Usability evaluation methods are used in all fields such as education (Zbick et al., 2015), health (Hsieh et al., 2019), finance (Hussain et al., 2015), transportation (Satria Putra et al., 2018), government (Huang & Benyoucef, 2014), and many others. In general, there are three aspects of usability that are measured in software, including in mobile applications, namely: efficient use, easy to learn, and can meet user satisfaction (Nayebi et al., 2012). The purpose of measuring the usability of a system is important for achieving customer trust (Ahmad et al., 2018).

To measuring the quality of mobile applications, we can use the Mobile Usability Evaluation Method, the Traditional Usability Methods, and the Mobile Usability Evaluation Framework (Rahmat et al., 2016). In addition there is also a usability evaluation to measure user satisfaction by using the System Usability Scale (SUS) (Harrati et al., 2016). Various aspects of measurement are also used to get maximum results to improve application performance, including aspects of user demographics based on age and gender (Michael Efuwape & Aremu, 2013).

The MyTelkonsel mobile application is an application created by Telkonsel provider to facilitate customers in obtaining information and conducting transactions using smartphones. This application is quite popular because it has been downloaded through Google Playstore more than 50 million times. But in the review given there is still dissatisfaction in its use. This study aims to improve the quality of the MyTelkonsel mobile application by measuring the level of satisfaction and acceptance of end-users and evaluating the relationship between the level of user satisfaction with user gender differences using the System Usability Scale (SUS) method.

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## 2. Literature Review

### 2.1. Usability

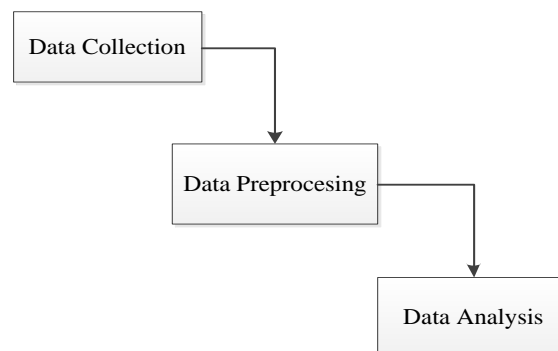
Usability evaluation according to the International Standards Organization (ISO), is to assess the effectiveness, efficiency, and satisfaction achieved by users to achieve specific goals. The test is carried out to evaluate the level of fulfillment of product usability criteria (Widyanti & Qurratu Ainizzamani, 2018). Effectiveness is based on the level of task completion by the user. Efficiency is based on the efforts that must be made to achieve a goal. Satisfaction refers to the level of user comfort when using the product (Huang & Benyoucef, 2014). Usability evaluation can be done in several ways, namely: (1) questionnaire, (2) user testing, (3) heuristic evaluation, (4) interview, and (5) protocol thinking-aloud, but many techniques are used to evaluate mobile applications with methods investigations using questionnaires in certain groups (Paz & Pow-Sang, 2016).

### 2.2. System Usability Scale (SUS)

System Usability Scale (SUS) can be used to measure the usefulness of mobile applications (Pekpazar & Gumussoy, 2019). SUS is a popular questionnaire in assessing perceived usefulness, both for usability studies and surveys, in addition to its use as a post-test questionnaire for assessing user perceived usefulness, SUS is also useful for retrospective evaluation of products and services (Grier et al., 2013). But do not have enough data to support the analysis. SUS contains 10 mixed tone items, with half of the items (odd numbers) positive and the other half (even numbers) negative, all with response scales from 1 (strongly disagree) to 5 (strongly agree) (Lewis, 2018a). Questionnaire according to the SUS method consisting of ten standard statements for the assessment of SUS scores (Lewis, 2018b).

## 3. Methodology

The study begins by determining the usability measurement method, the System Usability Scale (SUS), and preparing an assessment questionnaire. The next stage determines the criteria of the respondent, then tests the respondent, recapitulates the response of the respondent, calculates the SUS value, and analyzes the results of the assessment. Respondents are asked to answer all the questions filled in after the user has finished using the system as a whole. The data is then processed and analyzed so that the usability test results are obtained, the stages in data analysis can be seen in Figure 1.



**Fig. 1.** Stages in Data Analysis

### 3.1. Data Collection

In the method of data collection, questionnaires were distributed with quantitative data (Satria Putra et al., 2018), Telkomsel users who have used the MyTelkomsel application via smartphone as respondents. The questionnaire is divided into 2 parts, the first contains questions related to the target criteria of respondents and the second part contains 10 questions according to the standard questionnaire related to the assessment of user perception (Lewis, 2019). Participants were taken randomly, then selected based on criteria determined for the study, namely (1) Telkomsel user (2) using and owning a smartphone. Furthermore, participants who have never used the MyTelkomsel mobile application can download the application and perform application service functions such as regular pulse

check, data plan quota check, point check, point exchange, activate a data package, buy regular credit. After that the participants can fill out the Evaluation starting with filling in demographic data including name, age, gender, Telkomsel provider users, owning a smartphone, having used the MyTelkomsel mobile application. After completing the first part, participants continue to fill out the usability evaluation questionnaire based on their experience when using the application. This questionnaire contains questions about evaluating the MyTelkomsel mobile application system. These questions serve as data to be analyzed at a later stage. Participants complete the assignment and collect the complete(Brown et al., 2018).

### 3.2. Data Pre-Processing

After data collection, the next is data pre-processing. This step is needed to prepare respondent response data that meets the requirements for SUS calculation. At this stage, all respondent responses are entered in Microsoft Excel, then selected respondents according to predetermined criteria.

### 3.3. Data Analysis

At this stage, we identified usability questionnaire data using computer software such as Microsoft Excel and Microsoft Word (Ward et al., 2013). Analyzes were performed using the System Usability Scale (SUS). The SUS score calculation formula (Harrati et al., 2016) is seen in Eq. 1.

$$SUS=2.5 \times [\sum(U2n-1-1) + (5-U2n) 5n=1] \tag{1}$$

The first step is to determine the contribution of each item's score, between 0 to 4. Positive word items (odd numbers), the contribution of the score is the minus 1 position scale. For negative word items (even numbers), the contribution of the score is 5 minus the position scale. The overall SUS score is obtained by multiplying the total contribution item score by 2.5, which results in a score that can range from 0 (very poor perception of usability) to 100 (excellent perception of usability) in an increase of 2.5 points (Lewis, 2019). There are three perceptions in the SUS calculation results, namely acceptability, grade scale, and adjective rating. Acceptability there are three levels consisting of not acceptable, marginal, and acceptable. While the grade scale consists of A, B, C, D and F. For the adjective rating more levels are worst imaginable, poor, ok, good, excellent, and best imaginable. From the three System usability scale (SUS) assessments as shown in Figure 2 that acceptability is used to see the level of user acceptance of the apps, grade scale to see the level of software, and adjective rating to see the rating of the software produced.

In addition, SUS has another way to determine the results of the assessment, namely by using the SUS score percentile ranking. Determination of the assessment results based on the SUS ranking percentile score is done in general based on the results of the calculation of user ratings. SUS score the percentile score has a difference with acceptability, class scale, adjective rank because the SUS score is directly compared to general class requirements.

## 4. Results and Discussion

### 4.1. Respondents

The questionnaire was randomly distributed to 79 participants, after going through the pre-processing process of data based on the criteria of the sample being 46 which were appropriate and 33 were not suitable. Data that is not used is the respondent who gave responses more than once, then only the first response is used and respondents who are not Telkomsel provider users. The percentage of respondents by gender can be seen in figure 2.

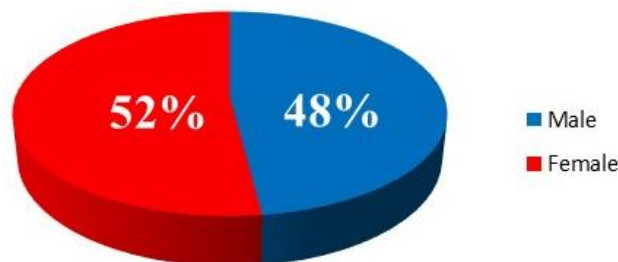


Fig. 2. Respondents Gender Percentage

The sample consisted of 48% of males as many as 22 respondents and 52% of females as many as 24 respondents. Most users are Telkomsel providers and have used the My Telkomsel application via smartphones as many as 42 people, while those who have never used the application as many as 4.

4.2. Respondent Assessment Results

Based on the data processing of the responses of respondents, the calculation results obtained by the SUS score of 71.96.

1) Acceptability, Grade Scale and Adjective Rating Determination of Acceptability, Grade Scale, and Adjective Rating to determine user perspective on the MyTelkomsel application. The results of the calculation of SUS values ranged from 43-100 points and the comparison of the results of the average value of respondents was 71.96 with the assessment provisions. The results of the MyTelkomsel application assessment by respondents are as follows: a) Acceptability range of users is in the Acceptable category, b) Level Grade Scale is in the C category, and c) Adjective Rating is in the Good category.

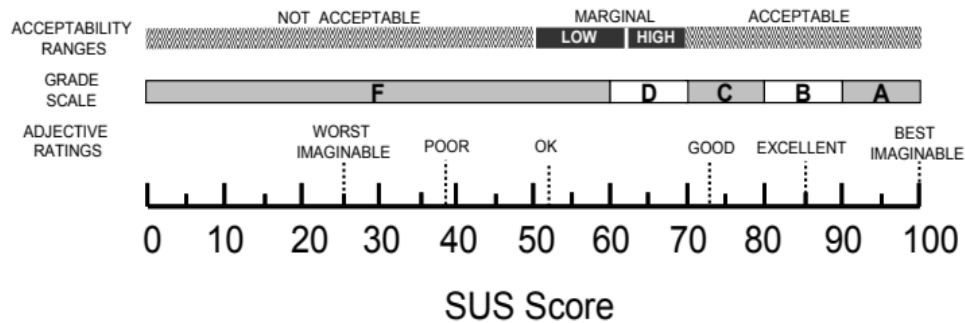


Fig. 3. SUS Score Rating

In Figure 5 it can be seen that the SUS calculation results are shown with a dashed red line.

2) SUS Score Percentile Rank

On the SUS score percentile rank a comparison of the results of general user ratings is made with the following conditions:

- a) Grade A: with a score  $\geq 80.3$
- b) Grade B: with scores  $\geq 74$  and  $< 80.3$
- c) Grade C: with scores  $\geq 68$  and  $< 74$
- d) Grade D: with scores  $\geq 51$  and  $< 68$
- e) Grade F: with a score  $< 51$

The results of the SUS score Percentile Rank on the MyTelkomsel application of 71.96 are in grade C.

Table 1. Sus Score Per Gender

	Number of Respondents	SUS SCORE	
		Mean	Std. Dev.
All Gender	46	71.96	13.10
Male	22	71.93	13.07
Female	24	71.98	13.41

SUS scores based on gender groups are evaluated subjectively as in table 1, showing that males with a total of 22 respondents had an average value of 71.93 and a standard deviation of 13.07 while in 24 female respondents the average value of the SUS score was 71,98 and standard deviations from 13.41.

If the calculations are disaggregated by gender, there is no significant difference in the average value of SUS scores between male and female. This shows that there is no relationship between gender differences with the level of satisfaction with the use of the MyTelkomsel mobile application via smartphone. According to the calculation of the

level of user acceptance included in the Acceptable category, the level of the Grade Scale in category C, and the adjective rating is still in the good category. Whereas the score ranking indicates that the MyTelkomsel mobile application is in class C. But because the value is 71.96 out of range 100, although this application is acceptable, there are still problems regarding its use. The SUS method can determine the level of user satisfaction of MyTelkomsel mobile application and assess the level of acceptance of the application. But do not have specific data to determine problems related to application usability. Increasing MyTelkomsel mobile application is important to be done to further increase the satisfaction of using the application.

## 5. Conclusion

The level of satisfaction and acceptance of end users of the MyTelkomsel mobile application is in the good category with an overall SUS score of 71.96. There is no significant relationship between user gender differences with the level of satisfaction and acceptance of this application, because the average value of the SUS score per gender is almost as large.

This study proves that the SUS method can be used in assessing the level of acceptance of a product and directing researchers in determining the level of user satisfaction. Nevertheless, the results of the calculation of SUS values do not have specific data to determine the problems related to application usability. Therefore, in future studies evaluating the usefulness of using more than one assessment method is highly recommended to get an in-depth analysis related to usability testing so that application improvement is more directed.

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