Measurement of the Usability of the Posyandu Information System for Teenagers using the System Usability Scale (SUS) at the Seruni Posyandu in Tangerang City

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Abstract— **Usability is a critical factor in the successful implementation of information systems, particularly in community-based health services involving adolescent users. This study aims to measure the usability level of a web-based adolescent Posyandu information system using the System Usability Scale (SUS) instrument. A quantitative descriptive method was applied by involving 10 adolescent respondents selected purposively at Posyandu Seruni, Tangerang City. Respondents were asked to complete several main task scenarios on the system and then provide their assessments through the SUS questionnaire. The results show that the average SUS score was 72.75 with a standard deviation of 10.30 and a 95% confidence interval ranging from 65.38 to 80.12. This score places the system in the "Good" category, indicating that the adolescent Posyandu information system has a fairly good level of usability and is acceptable to users. However, some respondents provided lower scores due to navigation difficulties and unclear terminology within the system. These findings provide a foundation for improving the interface and enhancing user experience in the next development stage.**

Index Terms— **Posyandu; Teeneger; usability; system; scale; web-based information system**.

I. INTRODUCTION

This research aims to measure the usability level of the Posyandu Remaja information system using the System Usability Scale method at Posyandu Seruni, Tangerang City. This study adopts a descriptive quantitative approach, utilizing the SUS questionnaire to collect user perception data regarding efficiency, ease of use, and overall satisfaction with the system [1]. The System Usability Scale method was chosen for its cost-effectiveness, minimal sample requirements, and relatively short implementation time, yet still provides adequate evaluation of the system's acceptability and usability [2]. This approach is highly relevant for public information systems like the Academic Information System, which aims to improve public services and user satisfaction [3]. Similar research has been widely conducted, such as the usability evaluation of the Simantan Web GIS using the System Usability Scale

method with 15 respondents, showing a final SUS score of 70.50[4]. Another study also applied SUS to measure user satisfaction of the Jaring Bencana application, with a SUS score of 68, indicating a "marginally acceptable" category[4]. This demonstrates that SUS is a reliable method for evaluating user experience objectively[5]. The implementation of SUS involves calculating a final score based on questionnaire responses comprising ten questions, where odd-numbered questions contribute positively to the score, and even-numbered questions are calculated inversely to obtain a final value reflecting the system's overall usability[5]. The obtained SUS score is then interpreted to determine the system's acceptability level, where a score above 68 is generally considered good or above average, while a score below 68 indicates a need for improvement [5]. This research will contribute to a better understanding of how the Posyandu Remaja information system can be optimized to meet user needs and improve operational efficiency. Similar studies have proven that usability testing of information systems, including academic systems, is crucial for enhancing public services and user satisfaction[5]. Therefore, evaluating the Posyandu Remaja information system through SUS will provide critical insights into areas requiring enhancement to ensure optimal functionality and end-user acceptance [6]. The SUS method, known for its ability to provide an overview of user satisfaction levels with a system, also allows for usability comparisons between different systems [2].

In the current era of digitalization, information systems have become the operational and strategic backbone across various sectors, including government, business, education, and healthcare. The presence of effective and efficient information systems is crucial for supporting decision-making, enhancing productivity, and delivering improved services [7]. However, functionality alone is insufficient to guarantee a system's success. The aspect of usability plays an equally vital role in determining user acceptance and satisfaction with a system[8]. Systems that boast advanced functionality but are difficult to use tend to be neglected or even rejected by users, which can

ultimately lead to implementation failures and significant losses[9]. Therefore, usability evaluation is an essential step in the development and maintenance lifecycle of information systems. Usability is defined as the extent to which a product can be used by specific users to achieve particular goals with effectiveness, efficiency, and satisfaction within a given context of use[9].

To measure usability objectively and standardize its assessment, various evaluation methods have been developed. One of the most popular, simple, and cost-effective instruments is the System Usability Scale [9]. The SUS is a ten-item questionnaire utilizing a five-point Likert scale, designed to measure users' subjective perceptions of a system's or product's usability[10]. The strength of SUS lies in its ability to provide a single, representative score, its flexibility in application across various system types—including software, websites, and mobile applications—and its reliability even with relatively small sample sizes [11]. The application of SUS has proven effective in numerous studies for identifying usability strengths and weaknesses, providing valuable input for improving system design and development [12].

Despite the availability of the Posyandu Remaja information system to support adolescent health services, its effectiveness is highly dependent on how easily teenage users can understand and use the system. Adolescents often have diverse levels of digital literacy and strong expectations for simple, intuitive interfaces; poor usability may result in low system adoption, user errors, and ineffective data utilization. However, the usability of the Posyandu Remaja information system has not yet been systematically evaluated. Therefore, this study aims to assess the usability of the Posyandu information system using the System Usability Scale (SUS) method. The results are expected to provide a clear measure of the system's usability from the users' perspective and to serve as a basis for recommendations to improve user experience and system efficiency.

II. LITERATURE REVIEW

This literature review analyzes previous work related to the evaluation of information system usability, particularly focusing on studies that employ the System Usability Scale. The concept of usability is further elaborated as the capacity of specific users to effectively and efficiently achieve particular goals, leading to user satisfaction [13]. Effectiveness refers to the precision and completeness with which objectives are met, efficiency pertains to resource utilization, and satisfaction is the subjective perception of the user's interaction experience [14]. Accurate and reliable usability evaluations are crucial to ensure optimal functionality of health information systems, including those utilized in adolescent Posyandu [15]. In the development of mobile health applications, usability assessment is vital for ensuring data security and accuracy [9]. Cross-cultural adaptation of instruments such as the SUS into local languages is essential for their validity in non-English contexts, ensuring that the cultural and linguistic nuances of users are accommodated[15].

Since its introduction in the 1980s, usability has been defined as a system quality attribute measuring interface ease, encompassing learnability, efficiency, memorability, error handling, and user satisfaction[15]. High usability in information systems, including information management systems, determines their successful implementation by influencing user perceptions and decisions [8]. Applications with high usability tend to attract a larger and more loyal user base[16], whereas systems with poor usability often face rejection[17]. Prior research indicates that usability is a primary principle of user interface/user experience design, aiming to minimize confusion and input errors while accelerating interaction[12]. Usability testing has proven to be an important method for identifying design issues and enhancing the overall user experience [18]. This approach integrates attributes of satisfaction, effectiveness, efficiency, and learnability, in accordance with ISO and Nielsen standards, for comprehensive evaluation[19].

III. METHODOLOGY

In this study, the methodological workflow was systematically structured to ensure that the analytical process proceeded in a focused and objective manner. The research began with the formulation of the problem, in which the primary issues relevant to the study were identified and defined. Following this stage, a comprehensive literature review was conducted to examine theoretical foundations, prior studies, and related concepts that support the development of the research framework. Based on insights derived from the literature, the appropriate research method was determined, including the procedures for data collection, the instruments employed, and the analytical approach. The subsequent stage involved data collection, carried out according to the predetermined procedures. The collected data were then processed and interpreted during the analysis stage to generate systematic and reliable findings. These findings served as the basis for drawing conclusions that address the research problem and illustrate the study's contributions. With the formulation of these conclusions, the overall research process was completed.

The research methodology for this study was designed to assess the usability of a web-based adolescent Posyandu information system using the System Usability Scale. This methodology encompasses the identification of participants, data collection through the SUS questionnaire, and analysis of the results by calculating SUS scores.

1. Participants

The participants in this study were ten adolescent Posyandu cadres from Posyandu Seruni in Tangerang City. Participants were selected using a purposive sampling technique, ensuring that respondents were

suitable for the research objectives as potential users of the adolescent Posyandu information system.
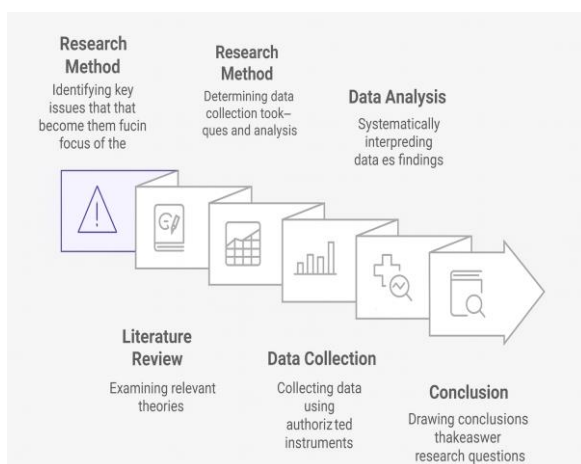

Figure 1. Research Methodology

2. Research Instrument

The research instrument employed was the 10-item SUS questionnaire. Each statement utilized a 5-point Likert scale, ranging from "Strongly Disagree" (score 1) to "Strongly Agree" (score 5). Odd-numbered (positive) statements represented aspects of ease of use, while even-numbered (negative) statements evaluated potential problems or obstacles in system usage [13].

3. Data Collection Procedure

The data collection process began with providing instructions to respondents on how to access and use the adolescent Posyandu information system. Respondents were asked to complete several main task scenarios, such as logging in, viewing activity schedules, and accessing health information. After completing these tasks, respondents were instructed to fill out the SUS questionnaire based on their system usage experience.

4. Data Analysis Technique

Data analysis was performed through the following steps:

1. For odd-numbered statements, 1 was subtracted from each response. For even-numbered statements, the score was calculated by subtracting the response score from 5[13].

2. The values from all 10 questions were then summed for each respondent.

3. The total sum was multiplied by 2.5 to yield a SUS score ranging from 0 to 100 [13].

4. The average SUS score across all respondents was calculated to obtain a representative usability score for the system. Based on literature, a system with a score of 68 and above is considered to have good usability [1], while a score of 70 is often used as a benchmark for acceptability[20].

5. SUS Method

The System Usability Scale (SUS) is a method that is quick to administer and inexpensive to use, especially when conducted online. SUS is one of the most efficient ways to collect statistically valid data and provides a clear and reasonably accurate score. Despite its simplicity, the SUS method remains sufficiently valid for use[1] .

There are several reasons why the SUS method is suitable for measuring the usability aspects of a product or service, namely[21]:

1. SUS is easy to use because the results are presented as a score ranging from 0 to 100, and a ready-to-use template for calculation is already available.

2. SUS is very simple to implement, does not require complex calculations, and does not demand many resources to manage.

3. SUS is freely available and does not require additional costs.

4. SUS has been proven to be valid and reliable, even when used with small sample sizes.

5. SUS can help product or service providers evaluate whether a system needs to be updated.

6. SUS can help evaluate the effectiveness of system improvements over time.

7. SUS can provide confidence to business owners to invest further in the user experience of their products or services.

However, there are several important considerations when using this method [2]:

2. The scoring system can be somewhat complex.

3. Because the final score is expressed as a value on a 0–100 scale, many people incorrectly interpret it as a percentage, which is not the case.

4. The best way to interpret the score is by normalizing it to produce a desired percentile rank.

5. This method is not diagnostic; in other words, SUS is not intended to diagnose specific usability problems in a product or service.

6. SUS Questionnaire

The SUS method works based on data obtained from distributing a questionnaire to respondents, using a Likert scale consisting of 10 questions answered by users of the product or service. Respondents give a rating for each question on a scale from 1 to 5, based on how strongly they agree with each statement in the SUS questionnaire. A score of 5 indicates strong agreement, while a score of 1 indicates strong disagreement. Table

1 below lists the 10 questions included in the SUS questionnaire [16].

IV. RESULT

Usability measurement was conducted with the involvement of 10 adolescent respondents who used the Posyandu information system. After completing the task scenarios, respondents completed the SUS questionnaire. The processed data results are presented in Table 1, displaying the System Usability Scale questions used in the assessment:
Q1. I think that I would like to use this system frequently.
Q2. I found the system unnecessarily complex.
Q3. I thought the system was easy to use.
Q4. I think that I would need the support of a technical person to be able to use this system.
Q5. I found the various functions in this system were well integrated.
Q6. I thought there was too much inconsistency in this system.
Q7. I would imagine that most people would learn to use this system very quickly.
Q8. I found the system very cumbersome to use.
Q9. I felt very confident using the system.
Q10. I needed to learn a lot of things before I could get going with this system.

TABLE I. SCORE OF SUS RESPONDENT

R	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS	Interpretation
R1	3	3	3	3	3	3	3	3	2	4	75	Good
R2	4	4	4	0	4	4	4	4	4	4	80	Good
R3	3	3	3	3	3	3	3	3	3	1	70	Good
R4	1	3	3	4	2	2	3	3	3	3	68	OK/Fair
R5	3	1	3	4	3	4	3	1	1	1	65	OK/Fair
R6	4	3	4	1	3	3	3	3	3	1	70	Good
R7	4	4	4	4	4	4	4	4	4	4	100	Excellent
R8	3	3	4	1	4	3	4	3	3	1	73	Good
R9	3	3	3	1	3	3	3	3	3	1	65	OK/Fair
R10	1	3	3	1	3	1	3	3	1	1	50	Poor

Based on the results of the usability assessment of the Adolescent Posyandu Information System using the System Usability Scale (SUS), the average score obtained was 72.75. This score is above the standard SUS average of 68, indicating that the system is considered "Good" and is acceptable to users. A score in this range also suggests that users find the system relatively easy to use and satisfactory in terms of overall usability.

In interpreting the results of the SUS score calculation, five approaches can be used. One of these is:
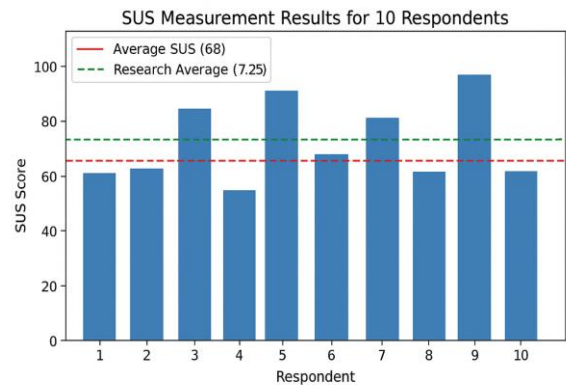

Figure 2. Graphic of SUS Respondent

1) Percentile Rank

The SUS score can be converted into a percentile rank. A percentile rank indicates the percentage of scores in the distribution that are equal to or lower than a given score. The figure below illustrates the percentile ranks for various SUS scores in general.
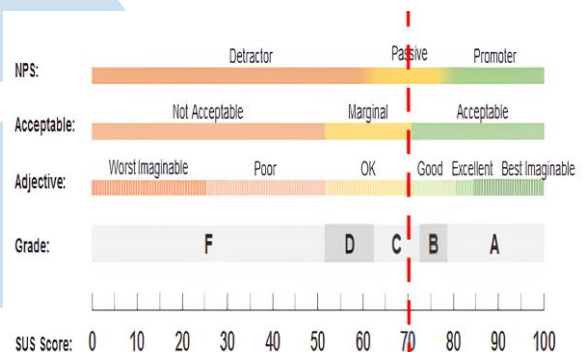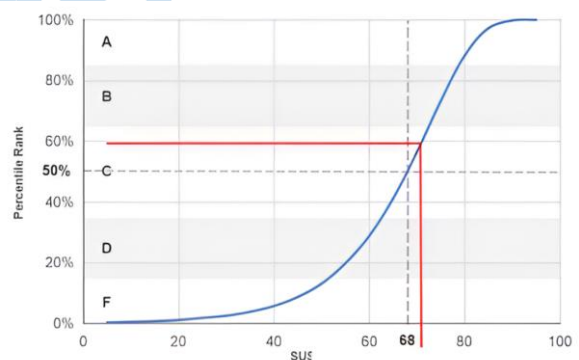

Figure 3. SUS Score Interpretation

Figure 4. SUS Score Curve in Percentiles

As is widely known, the average SUS score (at the 50th percentile) is 68. This means that a score equal to is considered average, and any score above 68 is categorized as above average.

In this study, the SUS score obtained was 70.03 (as illustrated in the corresponding percentile curve). When compared with the general SUS benchmark on the

percentile curve, this score falls within the above-average category.

This indicates that the usability score for the Posyandu Information System for Teenagers, as perceived by the respondents, is categorized as good.

2. Grade

Grade is an interpretation based on percentile ranking. SUS scores are categorized into grades ranging from A to F. Grade A indicates superior performance,vGrade C represents average performance, and Grade F indicates poor performance.
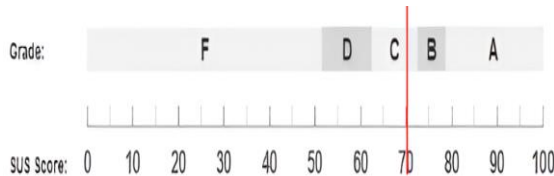

Figure 5. SUS Score in the Grade Scale

The SUS score obtained in this study was 70.03. When compared to the grade scale shown in the figure, the score falls into Grade C, which indicates an average level of usability.

3. Adjectives

The adjective rating scale for SUS scores consists of "Excellent," "Good," "OK," "Poor," and "Worst." Based on the results of this study, the score obtained was 70.03, which falls into the "OK" category.

This indicates that, according to the respondents, the usability of the Posyandu Information System for Teenagers is classified as OK.
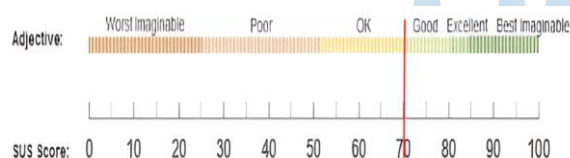

Figure 6. SUS Score in the Adjective Scale

4. Acceptability

Acceptability refers to whether a system is considered "acceptable," "marginally acceptable," or "not acceptable." A SUS score of 70 (slightly above the average SUS score of 68) is categorized as acceptable, because the threshold for unacceptable scores generally begins below 50 (which corresponds to a grade of F with a score lower than 51.6). Scores within the range of 50–70 are classified as "marginally acceptable," which corresponds to Grades C and D in the SUS evaluation scale. The score obtained in this study, 70.03, falls within the marginally acceptable category.
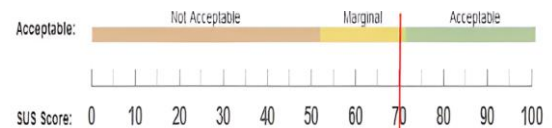

Figure 7. SUS Score in the acceptability Scale

4. Promoters daln Detractors

The SUS score of 70.03 obtained in this study, when associated with the NPS classification, falls into the **positive** category. This indicates that the respondents in this study have a positive perception of the Posyandu Information System for Teenagers. This result may reflect the respondents' knowledge and experience while using and exploring the Posyandu Information System for Teenagers.
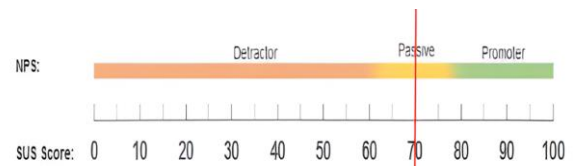

Figure 8. SUS Score NPS Classification

The average SUS score for respondents using the Posyandu Information System for Teenagers was 70.03. Based on the Adjective Ratings, this score falls into the "OK" category. According to the Grade Scales, the score corresponds to Grade C, and within the Acceptability Ranges, it is classified as "Marginal." This indicates that the Posyandu Information System for Teenagers interface is still considered acceptable by respondents, although not yet excellent.

However, based on the NPS classification, respondents tend to fall into the Passive category. Overall, respondents perceive the Posyandu Information System for Teenagers as fairly comfortable and easy to use, although there is still room for further improvement.

V. CONCLUSION

Based on the usability assessment of the Adolescent Posyandu Information System conducted using the System Usability Scale, an average score of 72.75 was obtained. This score exceeds the typical SUS average of 68, placing the system in the "Good" category. This indicates that the system possesses a satisfactory level of usability and is generally well-accepted by users. However, it was noted that some respondents provided scores below 70, highlighting areas that require improvement, particularly concerning navigation and the clarity of terminology within the system. Overall, this research confirms the adolescent Posyandu information system's suitability for use, with potential for further enhancements to optimize its support for web-based adolescent health services.

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