USABILITY EVALUATION OF SATUSEHAT APPLICATION USING USABILITY TESTING METHOD

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ABSTRACT

SatuSehat is an application created and developed by the government of the Republic of Indonesia with the aim of controlling and tracking the spread of Coronavirus Disease (Covid-19). SatuSehat application has a main feature, namely location tracking, which requires community participation as users to report each other's locations when they travel. This aims to track the location and history of contact with people with Covid-19. However, in its use and implementation, users face various problems such as slow and difficult to understand application responses, unclear information, and frequent application problems that suddenly close. This research was conducted to evaluate the usability value of the SatuSehat application. The research method used was the SUS method by giving a questionnaire consisting of 10 questions related to the SatuSehat application to 38 respondents in the initial study. Based on this research, 7 improvement recommendations were obtained which were then implemented in the SatuSehat application. The final result shows an average value of 61.7 (Grade D). After calculating the usability value of each respondent, the final result is 61.7 (Grade D).

Keywords: SatuSehat, User Evaluation, Usability Testing

1 INTRODUCTION

At the end of 2019, the world faced a Covid-19 pandemic that caused panic throughout the world's population. The President of Indonesia announced the first case in March 2020 [1], which requires the government to respond responsively to the spread of the Covid-19 virus, especially in the use of technology. One of the government's actions was to collaborate with the Ministry of Communication and Information Technology (Kominfo) to create the SatuSehat application, which is available for download through the Play Store and App Store. As of May 2022, SatuSehat has been downloaded more than 50 million times on the Play Store. The SatuSehat application is used by the Ministry of Health (Kemenkes) to track and inhibit the spread of Coronavirus Disease (Covid-19) [2], by providing information on handling the Covid-19 virus, the location of health facilities, as well as being a mandatory requirement before entering public facilities by showing the vaccination certificate listed in the SatuSehat application [3].

In addition, SatuSehat also relies on community participation to share location data when traveling, so that a history of contact with Covid-19 sufferers can be traced. This disease has initial symptoms similar to the common cold and can spread from one person to another. However, because it is a new virus, the body of an uninfected individual takes time to develop antibodies that can cause infection in the lungs, also known as pneumonia [4]. By reducing the spread of the virus in the community, it is expected that medical facilities can provide adequate care for patients so that there is no shortage of medical facilities [5]. The government needs to create applications to protect and cure. The SatuSehat application is used to collect data by the Task Force for the Acceleration of Handling Covid-19 and related agencies from various regions, with the aim of creating an integrated information system that applies throughout the country and the SatuSehat application is targeted at people who are in public places or public facilities [6].

According to Gatsou et al. [7], conducting usability testing on mobile applications is very important. The results of usability testing on users reveal that there are aspects that need to be improved, such as effectiveness in reducing errors made by users, and also providing user

satisfaction measurements using the SUS questionnaire method. Research conducted by Az-zahra [8] also emphasizes the importance of aspects such as learnability, effectiveness, and user satisfaction in measuring usability. In the study, the Concurrent Think Aloud (CTA) technique and SUS questionnaire were used as tools to measure these aspects. In order to deal with the existing problems, research was conducted on the SatuSehat application to evaluate its usability level using the Usability Testing method.

Usability is an important aspect that needs to be considered to determine the extent of effectiveness, efficiency, and user satisfaction in using a system, product, or service to achieve the specified goals [7]. In this study, the SatuSehat application that will be evaluated is the version that runs on Android devices, because Android users have the highest percentage in Indonesia compared to other operating systems [8]. The Usability Testing method is used in this study, where testing is done directly by involving users, by measuring 5 aspects of quality, namely Effectiveness in terms of ease of use of the application when it is first used, Memorability in the ease with which users can perform tasks after not using the application for a certain period of time, Efficiency in how quickly users achieve their goals.

Errors in the number of errors made by users, and Satisfaction in the level of user satisfaction when using the application. According to several researchers [9], the Usability Testing method involves respondents as participants, which allows the discovery of more real problems and a broader understanding of the users who are the main target of this application. In this study, the SUS (System Usability Scale) method is also used as a tool to measure the level of user satisfaction. The use of the SUS method was chosen because it has been tested and used for more than 30 years as a reliable method for evaluating the usability of a system based on industry standards. This test method will be used in the evaluation of the SatuSehat application.

2 LITERATURE REVIEW

User evaluation is a systematic process for evaluating the interaction between users and products or systems. The main purpose of user evaluation is to understand how users interact with the product or system, identify strengths and weaknesses in its use, and provide useful feedback for further improvement and development. User evaluation involves collecting data directly from users who use the product or system. This can be done through various methods and techniques, such as surveys, user testing, field observations, interviews, and qualitative analysis. The choice of methods used in user evaluation depends on the objectives of the research, the availability of resources, and the context of use of the product or system being evaluated.

The user evaluation process involves a series of steps such as planning, designing evaluation methods, collecting data, analyzing data, and reporting results. During the evaluation, users are given tasks and scenarios relevant to the use of the product or system, and then users' behaviors, responses, and experiences are observed and measured. Through user evaluation, valuable information can be obtained about the usability of the product or system, effectiveness in achieving user goals, efficiency of use, errors that occur, as well as the overall level of user satisfaction. User evaluations can also help identify user problems and barriers to use, so that design improvements, feature adjustments, and function enhancements can be made.

The benefits of user evaluation include:

1. Understanding user needs and preferences.
2. Identifying difficulties and challenges faced by users.
3. Getting direct feedback from users about the usage experience.
4. Assessing the usability and effectiveness of the product or system.
5. Measuring the level of user satisfaction.
6. Identify aspects that need to be fixed or improved in the design of the product or system.

By conducting regular user evaluations, product or system developers can continuously improve the quality and user experience, and ensure that the resulting product or system meets the needs and expectations of users.

3 RESEARCH METHODS

3.1 Online Survey or Questionnaire

In evaluating the use of the SatuSehat application using the usability testing method, a research method is used in the form of an online survey or the use of a questionnaire. An online survey or questionnaire is a method that allows researchers to collect data from respondents efficiently and in larger numbers. In this study, online surveys or questionnaires were used to collect data regarding user experience, user satisfaction, and user perceptions of the features of the SatuSehat application. The questionnaire is structured with questions related to the variables to be evaluated, such as usability, efficiency, and app suitability to user needs. Respondents who are the target of this online survey or questionnaire can be active users of the SatuSehat application. They are asked to fill out the questionnaire independently and provide responses based on their experience of using the SatuSehat application.

The data obtained from the online survey or questionnaire is then analyzed to gain a better understanding of user satisfaction, application shortcomings, and suggestions for improvement submitted by respondents. Data analysis may involve statistical calculations to identify common trends and patterns, as well as interpretation of qualitative findings that emerge from respondents' responses. This online survey or questionnaire method allows researchers to obtain representative data from a number of respondents in a relatively short period of time. This allows the researcher to get a more comprehensive picture of the use of the SatuSehat app and users' perceptions of the various aspects of usability being evaluated.

3.2 Observation

The observation research method is an approach used in research to collect data by directly observing the phenomenon being observed. In this method, researchers systematically observe and record behaviors, events, or phenomena that occur in the research environment. Observation can be done in real situations in the field or through observation of audio, video recordings, or written notes. Observation methods are often used to gain an in-depth understanding of social contexts, human interactions, behavior patterns, group dynamics, and other phenomena that cannot be controlled or manipulated. The main advantage of the observation research method is that the researcher can observe the phenomenon directly, so the data obtained can be more objective and natural. However, this method also has some limitations, such as the presence of researcher bias and the difficulty of generalizing the results of observations to a wider population. Therefore, observation is often combined with other methods, such as interviews or questionnaires, to gain a more comprehensive understanding of the phenomenon being studied.

3.3 Research Stages

This research begins by collecting data through Form distribution using Google Form, which contains a form for filling in the personal data required by the researcher, and the SUS questionnaire. After all the data is collected and complete, the next step is the Usability testing stage. The usability theory used as a reference in conducting the test is the usability theory proposed by Nielsen [10]. Usability testing consists of a stage that involves administering the SUS questionnaire. Nielsen in his article entitled "Introduction to Usability" explains that the process of identifying usability problems on a website or application can involve only 5 users as testers/respondents. Therefore, the first stage of testing was carried out in sessions involving 38 respondents who filled out the same form in each session [11].

This questionnaire will be used to measure the Satisfaction aspect. All data collected will be processed and analyzed to determine the level of usability and problems experienced by participants when using the SatuSehat application. The test results and questionnaires will provide information about the usability level of the SatuSehat application and the problems faced by each respondent.

3.4 Questionnaire Design

The questionnaire used is based on the System Usability Scale (SUS). The System Usability Scale (SUS) was developed by John Brooke in 1986 as a practical tool for evaluating various types of systems or products. The use of SUS has been tested for about 30 years and proven to be a reliable method of evaluating system usability. SUS is one of the easiest and most efficient measurement tools to evaluate the usability of a system or website by collecting statistically valid data and providing clear and rational values. Compared to other testing tools, SUS is faster with less number of questions and has provided ready-to-use templates. The creation of SUS aims to meet the need for simplicity and speed in evaluating existing systems, and can be used in various contexts and types of systems, including operating systems, hardware, software, and applications [12]. The SUS questionnaire consists of 10 questions used to measure usability, as follows:

Table 1. SUS Questionnaire Table

No	Question	Score
1.	I thought I wanted to use this app	1-5
2.	I find that this app is not made to be this complicated	1-5
3.	I think this app is easy to use	1-5
4.	I think I need the help of a technical person in using this system	1-5
5.	I find the various functions of this app well integrated	1-5
6.	I think there are too many inconsistencies in this system	1-5
7.	I would imagine that most people would have an easy time learning this app.	1-5
8.	I find this application very cumbersome	1-5
9.	I feel very confident in using this app	1-5
10.	I need to learn a lot before using this app.	1-5

To determine the grade of the assessment results, there are 2 (two) ways that can be used. The first determination is seen in terms of the level of user acceptance, scale grade and objective rating which consists of the level of user acceptance there are three categories namely not acceptable, marginal and acceptable. Meanwhile, in terms of the scale grade level, there are six scales, namely A, B, C, D, E and F. And from the rating adjective, it consists of worst imaginable, poor, ok, good, excellent, and best imaginable. The second determination is seen from the percentile range (SUS score) which has an assessment grade consisting of A, B, C, D and E. Determination of assessment results based on SUS score percentile rank is done in general based on the results of the calculation of user assessments. These two determinations can be seen in Table 2 and the following figure [13]:

Table 2. Sus Score Percentile Rank Table

Grade	Description
A	skor >= 80,3
B	skor >= 74 dan < 80,3
C	skor >= 68 dan < 74
D	skor >= 51 dan < 68
E	skor lebih < 51

The following Figure 2 shows the interpretation of the percentile comparison, rank, trait, acceptance rate, and NPS of SUS scores [14]:

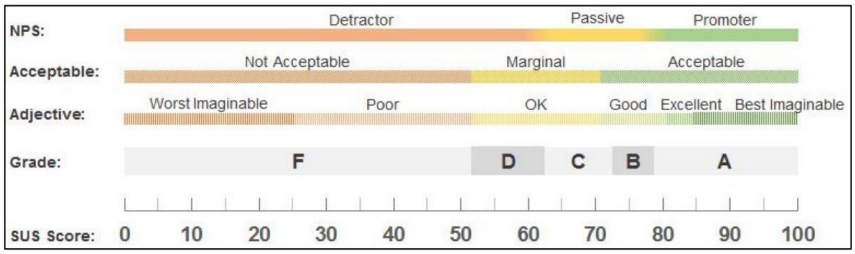

Figure 1. SUS Score Value Interpretation

From the figure above, it can be seen that there are five forms of approach in interpreting the value of the SUS score, namely:

1. Percentiles (Percentiles Rank) The raw value of the SUS score can be converted into a percentile value based on Figure 2 below:

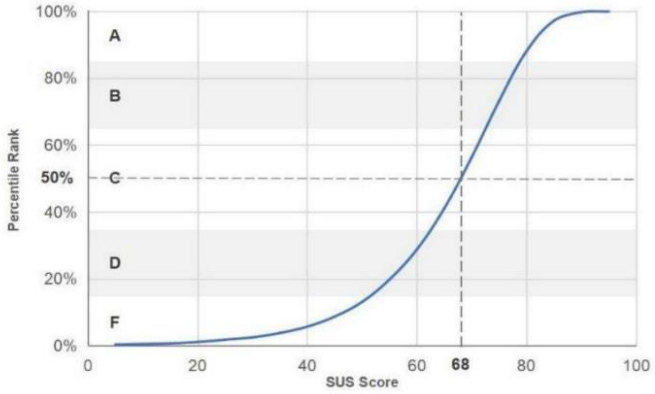

Figure 2. Example of SUS Score Percentile Value

2. From the example picture above, it can be seen that if the average value of the SUS score is 68, it will overlap with the 50% value of the percentiles rank so that it can be said that if the SUS score is below the value of 68, it is categorized as below the average value and if it is above or equal to the value of 68, it is categorized as being equal to or above the average value.
3. Grades For grades, the raw SUS scores can be grouped into ranks ranging from A to F, where A means very good, and F means very bad.
4. Adjectives The raw SUS score can also be paired with one of six adjectives. SUS scores above 85 are said to be Perfect / Excellent, scores of 72 and above fall into the Good category, or a score of 51 for OK.
5. Acceptable Another variation in interpreting the SUS score is to look at the acceptability of the raw SUS score. The acceptance level is "Acceptable" for score values above 70 and for "Unacceptable" starting from score values of 50 and below. Score values between 50 - 70 are considered "Marginally Acceptable", which covers the range from C to D on the rating scale.
6. Net Promoter Score (NPS) The last one is NPS. NPS is a survey of the level of user satisfaction and loyalty to a product related to how likely users are to recommend the product to others. NPS defines three classes of recommenders based on their responses to a 10-point likelihood (0 to 10) to recommend question. Promoter class for scores of 9 and 10, passive class for scores of 7 and 8, and detractors class for scores of 6 and below.

3.5 Usability Testing Calculation

Calculations in usability testing involve collecting and analyzing data obtained from usability testing of a product or system. The purpose of this calculation is to measure and evaluate the extent to which the product or system meets the usability criteria. In usability testing calculations, there are several metrics that can be used to measure and assess user performance. The data obtained through this questionnaire technique is to describe the characteristics of the variables used in measuring the usability testing of the SatuSehat application. Furthermore, the data obtained can be used as reference material and consideration for future application development.

PK	STS	TS	N	S	SS
VALUE	1	2	3	4	5

Description:
PK = Pertanyaan Kuesioner
STS = Sangat Tidak Setuju
TS = Tidak Setuju
N = Netral
S = Setuju
SS = Sangat Setuju

The questionnaire given to respondents, namely the general public, is used to obtain data from the five usability testing variables to be achieved, namely:

a. Effectiveness
   - I find that this application is not made this complicated.
   - I find the various functions in this application are well integrated.
b. Efficiency
   - I think this app is easy to use.
   - I think I need the help of a technical person in using this system.
c. Memorability
   - I would imagine that most people would find it easy to learn this application.
d. Errors
   - I think there are too many inconsistencies in this system.
   - I need to learn a lot before using this app.
e. Satisfaction
   - I think I want to use this app.
   - I feel very confident in using this app.
   - I find this app very cumbersome.

4 RESULTS AND DISCUSSION

The questionnaire consists of 10 questions with 2 detailed questions for the Effectiveness aspect, 2 questions for efficiency, 1 question for the memorability aspect, 2 questions for errors, and 3 questions for the statisfaction aspect given to 38 respondents using random sampling, which is collecting random samples selected from a larger set of students.

4.1 Usability Testing Questionnaire Results

Usability testing involves the process of filling out the SUS questionnaire by 38 respondents. Data from the questionnaire was used to measure the Effectiveness, Efficiency, Memorability, Errors, and Satisfaction aspects of the SatuSehat application, as well as identify problems that exist in the application. The results of usability testing include the percentage level of usability and problems found in the SatuSehat application. In this usability testing discussion, respondents are identified by a sign or code "R" followed by the respondent number, for example the sign or code R to the nth respondent (n = 20). The following is an analysis of the results of testing the usability aspects of the SatuSehat application.[15]

In this study, the authors conducted a data collection stage in the form of a questionnaire. The author involved 38 respondents consisting of general public users of the SatuSehat application. The details of the respondents in this study, as in Table 3.

Table 3 Distribution of General Public Respondents

Responden	Jumlah	Presentase
Semua Responden	38	100%
Laki-Laki	16	42.1%
Perempuan	22	57.9%

Table 4 Questionnaire Question List

No	Question
1	I thought I wanted to use this app
2	I find that this app is not made to be this complicated
3	I think this app is easy to use
4	I think I need the help of a technical person in using this system
5	I find the various functions of this app well integrated
6	I think there are too many inconsistencies in this system
7	I would imagine that most people would have an easy time learning this app.
8	I find this application very cumbersome
9	I feel very confident in using this app
10	I need to learn a lot before using this app.

Table 7 List of Coding for Each Question of the Questionnaire

No	Question	Sangat Tidak Setuju	Tidak Setuju	Netral	Setuju	Sangat Setuju
1	I thought I wanted to use this app	1	2	3	4	5
2	I find that this app is not made to be this complicated	1	2	3	4	5
3	I think this app is easy to use	1	2	3	4	5
4	I think I need the help of a technical person in using this system	1	2	3	4	5
5	I find the various functions of this app well integrated	1	2	3	4	5
6	I think there are too many inconsistencies in this system	1	2	3	4	5
7	I would imagine that most people would have an easy time learning this app.	1	2	3	4	5
8	I find this application very cumbersome	1	2	3	4	5
9	I feel very confident in using this app	1	2	3	4	5
10	I need to learn a lot before using this app.	1	2	3	4	5

Table 8 Data Processing Results

Responden	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS Raw Score	SUS Final Score
1	5	5	5	1	5	1	5	1	5	5	32	80
2	3	4	4	1	4	2	4	2	3	4	25	62,5
3	1	2	2	3	2	4	2	3	3	2	16	40
4	4	3	4	3	4	3	4	3	4	2	26	65
5	3	3	4	3	4	3	3	3	2	2	22	55
6	5	5	5	4	4	5	4	4	5	2	23	57,5
7	4	4	5	5	4	5	4	4	4	2	21	52,5
8	4	3	3	4	4	4	3	2	4	2	23	57,5
9	4	4	4	4	4	1	4	1	4	2	28	70
10	4	5	5	5	5	3	4	3	3	2	23	57,5

Responden	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS Raw Score	SUS Final Score
11	5	5	5	1	5	1	5	1	5	2	35	87,5
12	5	4	5	2	5	2	4	2	4	2	31	77,5
13	3	4	4	4	4	3	4	3	4	2	23	57,5
14	4	4	4	2	4	3	4	2	4	2	27	67,5
15	4	4	5	3	4	2	5	2	3	2	28	70
16	5	5	5	5	5	5	5	5	5	2	23	57,5
17	4	3	3	2	4	3	3	2	4	2	26	65
18	5	4	5	4	2	3	4	2	4	2	25	62,5
19	3	5	4	3	4	4	4	3	3	2	21	52,5
20	4	4	5	1	4	3	4	1	5	2	31	77,5
21	3	3	4	3	4	4	3	2	3	2	23	57,5
22	4	4	5	2	4	2	4	2	4	2	29	72,5
23	5	5	5	3	5	3	5	1	5	2	31	77,5
24	4	4	4	4	4	4	4	3	4	2	23	57,5
25	4	5	5	1	4	3	3	2	5	2	28	70
26	3	2	3	3	3	2	3	2	3	3	23	57,5
27	4	3	5	1	4	2	4	1	5	1	34	85
28	3	4	3	1	3	3	3	3	4	2	23	57,5
29	4	3	4	2	4	2	2	3	4	2	26	65
30	3	3	4	2	3	3	4	2	4	3	25	62,5
31	2	3	4	1	3	3	4	4	2	1	23	57,5
32	4	4	4	2	4	3	4	2	4	3	26	65
33	3	2	4	2	4	3	4	2	3	4	25	62,5
34	4	3	3	4	4	3	4	4	4	3	22	55
35	3	3	3	3	3	3	3	3	3	3	20	50
36	5	4	5	4	5	4	5	5	4	5	22	55
37	4	4	4	3	4	2	4	2	4	2	27	67,5
38	5	4	3	4	4	4	3	2	3	4	20	50
Total	146	143	158	105	150	113	145	94	146	91	959	2397,5
Average	**3,84**	**3,76**	**4,15**	**2,76**	**3,94**	**2,97**	**3,82**	**2,47**	**3,84**	**2,91**	**24,7**	**61,7**

Usability testing involves the process of filling out the SUS questionnaire by 38 respondents. Data from the questionnaire was used to measure the Effectiveness, Efficiency, Memorability, Errors, and Satisfaction aspects of the SatuSehat application, as well as identify problems that exist in the application. The results of usability testing include the percentage level of usability and problems found in the SatuSehat application. In this usability testing discussion, respondents are identified by a sign or code "R" followed by the respondent number, for example the sign or code R to the nth respondent (n = 20). The following is an analysis of the results of testing the usability aspects of the SatuSehat application. [16]

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Table 9. Recap of Usability Testing Values Per Category

No	Question	Value
	EFFECTIVENESS	
1	I found that this app was not made to be this complicated	3,76
2	I found the various functions in this app to be well integrated.	3,94
	Average:	**3,85**
	EFFICIENCY	
1	I think this app is easy to use.	4,15
2	I think I need the help of a technical person in using this system.	2,76

No	Question		Value
		Average:	**3,45**
	MEMORABILITY		
1	I would imagine that most people would have an easy time learning this app.		3,82
		Average:	**3,82**
	ERRORS		
1	I think there are too many inconsistencies in this system.		2,97
2	I need to learn a lot before using this app.		2,91
		Average:	**2,94**
	SATISFACTION		
1	I think I want to use this app.		3,84
2	I feel very confident in using this app.		2,47
3	I find this app very cumbersome.		3,84
		Average:	**3,38**

4.2 Data Analysis of Average Score

1. The Effectiveness aspect which has three questions (Q2, Q5) is assessed, with an average score of 3.85 after being converted to a scale of 5, it is included in rating scale 4 with the Agree category, which means that most respondents find it easy to learn the application to complete certain tasks. [17]
2. The Efficiency aspect which has three questions (Q3,Q4) is assessed, with a mean score of 3.45 after being converted into a scale of 5, it is included in the rating scale of 3 with the Agree category, which means that most respondents feel the application is quite efficient in completing certain tasks or instructions.
3. Memorability aspect which has three questions (Q7) assessed, with a mean score of 3.82 after being converted into a scale of 5, it is included in the rating scale 4 with the Easy category, which means that most respondents feel that the appearance of the application is easy to remember, both in terms of features or menus and how to operate.
4. The Errors aspect, which has three questions (Q10, Q11, Q12) that are assessed, with an average score of 2.94 after being converted to a scale of 5, is included in the rating scale 3 with the Easy category, which means that most respondents find it easy to find errors or errors when clicking on menus in the application.
5. The Satisfaction aspect which has three questions (Q1, Q8, Q9) is assessed, with an average score of 3.38 converted to a scale of 5, it is included in Rating scale 3 with the Easy category, which means that most respondents feel the application provides good performance so that some users agree to promote the SatuSehat application.

5 CONCLUSIONS

Based on usability measurements from SatuSehat Application users that have been carried out using the Usability Testing method involving 38 respondents who filled out the SUS questionnaire from students in the University environment, which were selected using the Random Sampling technique. SatuSehat application gets evaluation results that are considered quite good from 5 aspects of usability.

Based on the previous explanation, the author concludes the following. First, the SatuSehat application can be used well and has an adequate level of usability so that it is useful for the community and government during a pandemic. Second, the usability value of the SatuSehat application currently reaches 61 or is given Grade D. In this study, it is also suggested that improvements be made to the application's performance to increase its ease and speed of use.[18]

Based on the evaluation of the use of the SatuSehat application using the usability testing method, it can be concluded that this application provides convenience in purchasing tickets online. The average score of 5 categories is 3.48. From several aspects of usability, SatuSehat

application has gotten a pretty good score, such as Effectiveness, Efficiency, Memorability, and Satisfaction. This shows that users can easily learn to use the app, complete tasks efficiently, remember previous uses, and feel satisfied with the usage experience.[19]

However, the evaluation also revealed some usability issues that need to be improved. The Errors aspect is one area that needs more attention. The development team needs to find the right solution to overcome this problem, so that users can feel comfortable in using the application without experiencing annoying problems. Overall, evaluating the use of the SatuSehat application with the usability testing method makes an important contribution to understanding the usability of this application. The evaluation results can be the basis for further improvement and development to increase user satisfaction and effectiveness of application use. By involving users in the evaluation process, the SatuSehat application can become more user-friendly and better meet the needs and expectations of users.

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