Maping Patient Covid-19

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Usability Analysis to Measure the Effectiveness of Implementing the Mapping System for COVID-19 Patients

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***Abstract*— The Mapping System for COVID-19 sufferers is a system built from research results that can detect first aid symptoms and risks of COVID-19 suffered by residents, so that residents know their own health status without checking the health of the COVID-19 task force in each area. The system is equipped with a feature to read the location of residents who report their health so that it is known where they are. As well as the feature of determining the health status of residents in the Negative COVID-19, ODR, ODP, PDP, or Positive COVID-19 categories. Of all these features, to evaluate the system and assess user satisfaction, it is necessary to analyze using usability to measure its effectiveness. So that the shortcomings are found and can be identified and developed even better. By using the Software Usability System (SUS) Questionnaire and involving 25 respondents from the community, it can be seen that the average satisfaction score is 68.8. So that the results can be stated to be quite satisfied in using the mapping system for COVID-19 sufferers.**

Keywords*— *effectiveness, usability, mapping system for COVID-19 Patients, respondents

I. INTRODUCTION

COVID-19 is a virus that is transmitted through the air and attacks human respiration [1]. The effect of the virus causes a relatively high mortality rate, especially in Indonesia [2]. In 2020 the Indonesian government stated that COVID-19 would become a pandemic in the State of Indonesia [2]. All activities and activities of the Indonesian people from all sectors of activity are limited and regulated by the government by implementing the Health Protocol to break the chain of spread of the COVID-19 virus [3].

Controlling community activities in activities and activities requires a lot of energy and money because everything must be conditioned according to the rules in order to break the spread of the COVID-19 virus [4]. Many people feel afraid and embarrassed to report if they feel they are infected with the symptoms of the COVID-19 virus such as high fever, cough, runny nose and temporarily reduced/disappeared sense of smell [5]. There is a separate reason that people do not report if they are infected with these symptoms because they are ashamed of their neighbors/relatives/friends. So finally the solution is isoman (self-isolation) at home, by applying health protocols and self-medicating [6].

The isoman method is something that is widely taken by the community lately if the family is infected with COVID-19 symptoms [6]. But many people do isoman who do not report to the government (village apparatus) because of shame/fear of spreading if their family is infected with COVID-19. From this, there is a mapping system for COVID-19 sufferers that can map COVID-19 sufferers. If there are people who are infected with COVID-19 symptoms, the system will recommend what action should be taken against these sufferers. In addition, the system can also notify the government (COVID-19 task force) at the village level for action to be taken.

In this study, we will discuss how important the mapping system for COVID-19 sufferers is in terms of usability because this system is already running in several areas, including Malang and Pasuruan Regency. This system is very useful if there are people who are embarrassed/afraid to report if they are infected with COVID-19 symptoms. By measuring the usability of the mapping system for COVID-19 sufferers, it is expected to be able to find out the weaknesses and strengths of the system in terms of user-friendly navigation (User Experience) and the usability of the system based on a group of users [7].

II. METHOD

In the development and construction of a mapping system for COVID-19 sufferers until the completion of the stages carried out using the stages and flows as shown in Figure 1. The flow is used as a reference in carrying out the activity stages.

Fig. 1. Stages of implementation of activities

Furthermore, the stages of research carried out in the discussion of this paper refer to Figure 2. The researcher's step begins with problem identification and data collection with

methods such as interviews, questionnaires to obtain supporting data.

Fig. 2. System Usability Implementation Stages

A. *Problem Identification*

The data collection method to test the usability used is an online questionnaire. After that, the documentation technique was carried out by collecting questionnaire reports. Finally, the researcher also conducted a literature study by studying questionnaires and techniques and reading relevant journals.

B. *Software Usability System*

One way to propose a system is to use technical usability testing. Usability testing is what is used to develop a system or system where the system testing process or can involve direct testing of user representatives [12]. The test carried out in this study is to assess whether the interface of this website is easy to use or not. The user technique used in conducting this test is by observing randomly to run certain applications on the testing system for COVID-19 sufferers.

According to Buur and Sung (1999 in Suparmo (2007:49), several stages in conducting the test usability are:

(1) *Planning a usability test*. Planning usability test is a factor important because this factor determines the success of the usability test. In the This planning needs to include goals, problems, profile respondents, make a list of questions, and equipment to be used.

(2) *Selecting a representative sample and recruiting participants*. Determination respondent is an important element The selected respondents should be adapted to the characteristics and conditions respondents who will use site or system.

(3) *Conducting the usability test*. Certain on the implementation of usability tests.

(4) *Debriefing the participants*. Debriefing meant to ask to respondents about all was carried out during the test.

(5) *Analyzing the data of the usability test*. Data analysis is intended as grouping data according to categories of data that have been collected.

(6) *Reporting the results and making recommendations to improve the design and effectiveness of the product*. Usability test report generation should make trouble and suggestion to fix it.

Usability Testing According to Badre (2002, in Cahyadi (2015:18)), defines usability testing or usability test as follows "usability testing has traditionally meant testing for efficiency, ease of learning, and ability to remember how to perform interactive tasks without difficulty or errors". In other words usability test is a test of efficiency, convenience learned, and the ability to remember how to interact without trouble or error.

According to Jacob Nielson (2003, in Cahyadi (2015:18)), defines usability testing (usability testing) based on five components, namely learned (learnability), efficient (efficiency), easy to remember (memorability), safe to use or reduce levels errors (errors) and has a rate of satisfaction (satisfaction). From the two opinions above, the author concludes that usability testing is usability testing or usability that measures based on easy to learn, efficient in use, easy to remember and able interact without difficulty or error.

Usability Testing Components. According to Jacob Nielson (2003, in (Santoso, 2009: 78), there are five aspects usability or the five usability attributes, Explanation of the five aspects of usability the testing is as follows: (1) Learnability (easy to learn). System quality that shows is the system easy to learn and used in solving specific task, (2) Efficiency (efficiency). How to get carried out by the system to support user in doing his job, has rarities simple to get same result, (3) Memorability (easy to remember). System capabilities for easy remember, both in terms of existing features or menus as well as operation, (4) Errors (errors). Protection and help to users conditions and situations that are not desirable and dangerous when operate the system, for example: menu help to provide solutions, and confirm deletion of files, (5) Satisfaction (satisfaction). Pointing to a situation where users are satisfied after use the system because the convenience of the system. The more users like a system, implicitly they feel satisfied with the system in question.

The research method used in this research is descriptive method. "Where descriptive research is a form of research that aims to describe existing phenomena, both natural and artificial" [8]. The research tool used to collect data is the Software Usability System "SUS" questionnaire. In particular, a questionnaire is used to measure user satisfaction with the system. At usability.gov, there are several benefits of using the SUS questionnaire, namely "adjustment of respondents due to ease of use of the scale; (can be u in small numbers with reliable and (3) valid results." The SUS questionnaire consists of ten questions with five answer choices for respondents represented by a Likert scale. Table 1 [9] is a questionnaire SUS table that has been adapted to this need.

TABLE I. TABLE 1 RESPONDENTS AVERAGE USABILITY SCORE [9]

No	Question	1	2	3	4	5
1	I realized I wanted to use this system					
2	The use of this COVID-19 patient mapping system is not complicated					
3	I think the system is easy to use.					
4	I feel I will need help from a technical person to be able to use this system					
5	I found the various functions in the system well integrated					
6	I think there are too many inconsistencies in this system					
7	I imagine that most people will learn to use this system very quickly					

8	I found that the COVID-19 mapping system was very complicated to use.					
9	I feel very confident using this system.					
10	I need to learn a lot of things before I can use the system.					

And the data is based on the analysis of filling out the SUS (Software Usability System) questionnaire to 4.444 respondents. According to [10] [8], to analyze the SUS questionnaire, the steps are as follows (1) if the number is odd then the score of the odd number is subtracted by 1. For example number 5 is answered strongly agree then the score for statement number 5 is 5- 1=(4), (2) for the statement of even number of questions, the score of each question is deducted from the highest score. Suppose number 6 is answered, then the score for question number 6 is 5-4=(1). Then, after getting an overall assessment from all respondents, the average of the total assessments is obtained.

According to [11], the SUS estimate is in the range of 0-100. Percentile Rank graph is a graph to see the quality of the software being tested based on the SUS score. It can be said that the system usability is of good quality if the SUS value is >= 70, and the system usability is below average (not very good) if it is less than 70.

III. Result And Discussion

After distributing the SUS questionnaire to the community at random, the results of the statement values are obtained as shown in Table 2.

TABLE II. Result of Obtaining Respondents for the Software Usability System (SUS) Questionnaire

Respondents	Question									
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	5	5	5	5	5	2	5	2	5	5
2	5	1	5	5	5	2	5	2	5	5
3	2	2	4	4	4	3	4	3	4	5
4	5	1	5	5	5	2	5	2	5	5
5	2	1	4	4	4	3	4	3	4	5
6	5	5	5	5	5	2	5	2	5	5
7	5	2	5	5	5	2	5	2	5	5
8	5	4	5	5	5	2	5	2	5	5
9	2	1	4	4	4	3	4	3	4	5
10	2	1	4	4	4	3	4	3	4	1
11	5	3	5	5	5	2	5	2	5	5
12	5	1	5	5	5	2	5	2	5	5
13	2	2	4	4	4	3	4	3	4	5
14	5	3	5	5	5	2	5	2	5	5
15	5	1	5	5	5	2	5	2	5	1
16	5	1	5	5	5	2	5	2	5	1
17	5	3	5	5	5	2	5	2	5	5
18	5	1	5	5	5	2	5	2	5	5
19	5	1	5	5	5	2	5	2	5	5
20	2	1	4	4	4	3	4	3	4	5
21	5	1	5	5	5	2	5	2	5	5
22	5	1	5	5	5	2	5	2	5	1
23	5	1	5	5	5	2	5	2	5	1
24	2	2	4	4	4	3	4	3	4	5
25	2	2	4	4	4	3	4	3	4	1

The questionnaires are distributed randomly because almost all aspects of society have COVID-19 sufferers and have been exposed to COVID-19, even though only symptoms of Covid-19. So if at the time of filling out the questionnaire there were people who had been affected or had COVID-19, including in general public. The identity of the questionnaire filler is initials name, address, age, status (student/lecturer/general/student). Age to find out at what age the most exposed to COVID-19 if the respondent is taken randomly. While the status is to find out trends or patterns exposed to COVID-19 when viewed in terms of daily work status. After distributing the SUS questionnaire randomly to the public, the results of the statement values are obtained as shown in Table 3. Data from the results of the respondents' acquisition of the Usability System (SUS) software questionnaire in Table 3 then calculated the score of each respondent by Brooke's method. The results of the scores of each respondent can be seen in Table 3.

TABLE III. Result Score Respondents

Respondents	Total Score	Average Score
1	26	65
2	30	75
3	21	52.5
4	30	75
5	22	55
6	26	65
7	29	72.5
8	27	67.5
9	22	55
10	26	65
11	28	70
12	30	75
13	21	52.5
14	28	70
15	34	85
16	34	85
17	28	70
18	30	75
19	30	75
20	22	55
21	30	75
22	34	85
23	34	85
24	21	52.5
25	25	62.5
Total score	688	1720
Average	27.52	68.8

Table 3 shows that the average score of the SUS questionnaire is less than 70, so it can be concluded that the utilization of the system is below average (not good). Then analyze the questionnaire scores based on the SUS questionnaire analysis steps described previously. The results of the analysis of the SUS questionnaire scores for each user are used as user satisfaction scores for the COVID-19 patient mapping system. The value of user satisfaction with the Mapping System for COVID-19 Patients from 25 respondents taken from the community at random can be seen in Figure 3.

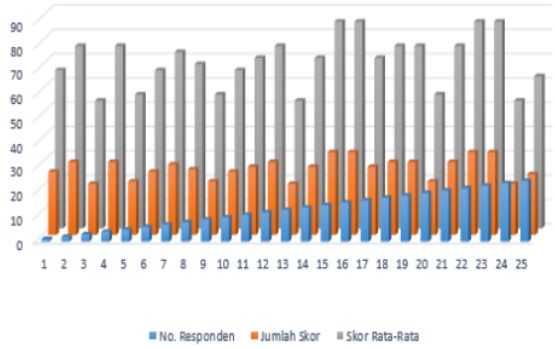

Fig. 3. Average score usability respondents

Figure 3 shows the results of the user satisfaction assessment of the COVID-19 mapping system. Based on the graph, it can be seen that the value of user satisfaction comes from the community randomly resulting in a usability value that is quite satisfied. The results are quite satisfied after an analysis of each item of the SUS questionnaire is caused by several things including (1) respondents feel that the mapping system for COVID-19 sufferers can make it easier to detect COVID-19 prone areas (2) respondents feel they can prevent the transmission of COVID-19 (3) respondents feel that if they have the vaccine, there is no need for mapping of COVID-19 sufferers and (4) respondents feel that they are complete with the *Peduli Lindungi* application.

To distinguish the mapping system for COVID-19 sufferers from the *Peduli Lindungi* application is the scope of its use. The mapping system for COVID-19 sufferers can be monitored by admins at the lowest level of government, namely RT/RW. While the *Peduli Lindungi* application can detect COVID-19 sufferers at the village level, not to the RT/RW. It can be seen that the average satisfaction value of all respondents to the mapping system of COVID-19 sufferers as a whole is 68.8. These results show that overall respondents are quite satisfied with using the mapping system for COVID-19 sufferers.

Based on the results of the SUS, it can be concluded that it is necessary to develop a geolocation-based mapping system for Covid-19 patients in the RT/RW environment so that if there are patients who are detected by Covid-19, they can be immediately handled according to the existing health protocol. Because fast and responsive action against Covid-19 sufferers is urgently needed so that patients can be treated immediately.

IV. Conclusion

It can be seen that the average satisfaction value of all respondents to the mapping system of COVID-19 sufferers as a whole is 68.8. These results show that the respondents overall have an average quality of 68.8 so that respondents are stated to be quite satisfied in using the mapping system for COVID-19 sufferers.

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