

Comparational Analysis of Telemedicine Service Quality in Halodoc and Alodokter Mobile Applications on User Satisfaction During the Covid-19 Pandemic in Indonesia

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Abstract—This analysis aims to compare the level of user satisfaction on the Halodoc and Alodokter mobile applications (Performance, Information/Data, Economic, Control/Security, Efficiency, Service) using The Balanced Scorecard model and the Likert Scale used to determine the rating scale. The data used is data obtained from the results of distributing questionnaires via Google Form to 41 respondents, 6 of whom did not fill out the questionnaire. The collected questionnaire data is then used to measure the level of user satisfaction of the two applications which are expected to be input for application development. The results of this study indicate that the value points of the Halodoc application are higher than the Alodokter application, so it can be concluded that the research conducted on 35 respondents from PT Bee Solution Partners considers that the Halodoc application has a better level of satisfaction than the Alodokter application.

Keywords— Alodokter, Analysis, Halodoc, PIECES Method, Telemedicine.

I. INTRODUCTION

People are now familiar with the Corona Virus, the virus was first discovered in the city of Wuhan, China at the end of December 2019. Coronavirus or Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a virus that attacks the respiratory system. The disease due to infection with this virus is called COVID-19. Corona virus can cause mild disturbances in the respiratory system, severe lung infections, and even death.

SARS-CoV-2, better known as the Corona Virus, is a new type of corona virus that is transmitted to humans. This virus can affect anyone, such as the elderly, adults, children, and babies, including pregnant women and nursing mothers.

Currently, the Corona Virus is still spreading throughout the world, with a total of 200 million positive cases and 4 million deaths. Indonesia has recorded more than 4 million positive cases and more than 100 thousand deaths, almost all hospitals and COVID-19 isolation sites are no longer able to accommodate and handle COVID-19 patients, whose number of cases is currently still quite high in Indonesia. Currently, people who suffer from COVID-19 or suffer from other diseases, have difficulty consulting with a doctor directly at the hospital, one way that can be done to consult a doctor is to use telemedicine.

Telemedicine is the use of telecommunications to provide information and medical services over long distances. There are a lot of mobile telemedicine applications that are used by the public to consult with doctors during the COVID-19 Pandemic, but the popularity and number of these applications do not provide a guarantee of satisfaction for users so a method is needed to see the relationship between the available applications and user satisfaction. This study analyzed the Halodoc and Alodokter mobile applications to find out the comparison of the level of user satisfaction of the Halodoc and Alodokter mobile applications at PT Bee Solution Partners in terms of performance, information / data, economy, control / security, efficiency, and services using the PIECES method.

II. LITERATURE REVIEW

Halodoc is a technology company from Indonesia that serves in the field of health teleconsultation. The company was founded in 2016 in Jakarta by Jonathan Sudharta. Through Halodoc, people can talk to specialist doctors, buy medicines, and do laboratory examinations via smartphones anytime, anywhere for 24 hours. Halodoc's goal is simplifying healthcare, which is to facilitate access to health for all Indonesians (<https://www.halodoc.com/media>).

ALODOKTER is the number one digital health platform in Indonesia with more than 26 million active users every month, as well as more than 30 thousand doctors joining. Since 2014, ALODOKTER has excelled in providing health information that is accurate, easy to understand, and accessible to anyone, anytime, and anywhere. All health information available at ALODOKTER is compiled in Indonesian that is easy to understand and review by a team of competent doctors (<https://www.alodokter.com/about>).

The quality of service can be known by comparing the perception of consumers of the service that is actually received or obtained with the service that is actually expected or desired to the attributes of a company's service. Research conducted by (Asbar & Ari, 2017) on service quality quoted by (Tjiptono, 2007) states that service quality is an effort to meet consumer needs, consumer desires and the accuracy of its delivery in keeping pace with consumer expectations. The quality of service can be seen through three perceptions, namely service is perceived to be good and satisfactory when

the services received and felt by consumers are in accordance with what is expected, services are perceived to be very good and quality when the services received and felt exceed consumer expectations, besides that the quality of services can also be perceived poorly when the services received by consumers are lower than what was expected.

Research conducted by (Asbar & Ari, 2017) on customer satisfaction cited by (Kotler, 2006) states that a person's feeling of pleasure or disappointment that arises after comparing between the performance (results) of the thought product against the expected performance. The benefits obtained from consumer satisfaction, namely the harmonious relationship built between the company and consumers, and the loyalty or loyal attitude of consumers towards the company to make money purchases.

A. *PIECES method*

The PIECES method consists of six variables used to analyze information systems, namely (Prayogi et al., n.d.): Performance, Information / Data, Economics, Control / Security, Efficiency, Service.

1) *Performance*

This variable is used to determine the performance of a system, whether it is running well or not. This performance can be measured by the number of data findings generated and how quickly a piece of data can be found.

2) *Information /Data*

In a data finding will inevitably be generated an information that will be displayed this variable is used to analyze how much and how clearly the information will be generated for a single search.

3) *Economics (Economic Value)*

This variable is used to analyze the system, to find out whether a system is appropriately applied to an information institution in terms of finances and costs incurred. This is very important because a system is also influenced by the amount of costs incurred.

4) *Control and Security*

In a system, it is necessary to hold a control or supervision so that the system runs well. This analysis is used to determine the extent of the supervision and control carried out so that the system runs well.

5) *Efficiency*

The efficiency and effectiveness of a system needs to be questioned in performance and the reasons why it was created. A system must be able to efficiently answer and help a problem, especially in terms of automation. This analysis is carried out to find out whether a system is efficient or not, with few inputs that can produce a satisfactory output.

6) *Service*

In terms of utilizing a system, a service is still an important thing and needs to be considered. A system that is implemented will run well and be balanced when balanced with good service as well. This analysis is used to find out how the service is carried out and find out the problems that exist related to the service.

III. METHODOLOGY

This research using the PIECES method began with making a statement about the application, then continued with the creation of a questionnaire aimed at 41 respondents. The next stage is the collection of data from questionnaires that have been filled out by respondents, then enter the calculation stage of each category in the PIECES method. After getting the results of each category, it then calculates the average satisfaction level of each category that has been calculated. The last stage is to compare the two applications based on the categories of the PIECES method.

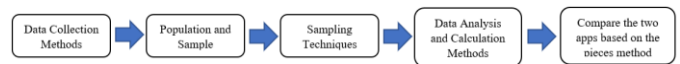


Fig. 1. Research Phase with PIECES Method

A. *Data Collection Methods*

Data obtained from Halodoc and Alodokter application analysis based on application performance, information from the application, in terms of application economy, control or security of the application, application efficiency, and service of the application.

1) *Questionnaire*

The questionnaire was distributed through Google Form to respondents, namely employees at PT Bee Solution Partners.

2) *Observation*

Primary data is obtained through direct observation of the object of study, namely by making observations using Google Form.

B. *Population and Sample*

The sample taken was all employees of PT Bee Solution Partners or a total of 41 people who used the Halodoc and Alodokter applications.

C. *Sampling Techniques*

The sampling technique in this study used non-probability sampling with a saturated sampling technique or often called total sampling. Another term for a saturated sample is census, where all members of the population are sampled.

D. *Data Analysis and Calculation Methods*

The distribution of questionnaires was carried out to 41 respondents at PT. Bee Solution Partners who are users of Halodoc and Alodokter mobile applications through Google Form. The statement on the questionnaire has passed the validity test and reliability test whose results are valid. The results of the distribution of the questionnaire collected were 35 respondents, 6 of whom did not fill out the questionnaire. The processing of the collected questionnaire data uses the Likert Scale to determine the range of satisfaction levels of Halodoc and Alodokter mobile application users and to get the average value of the satisfaction level, namely by using the equation formula (1):

$$RK = (1) \frac{JSK}{JK}$$

RK = Average Satisfaction

JSK = Total Questionnaire Score

JK = Number of Questionnaires

As for determining the level of user satisfaction, it is as follows:

- 1.00 – 1.79 = Very Dissatisfied
- 1.8 – 2.59 = Dissatisfied
- 2.6 – 3.39 = Neutral
- 3.4 – 4.91 = Satisfied
- 4.92 – 5 = Very Satisfied

IV. RESULT

The results of this study used questionnaire data that had been filled out by respondents as a trial of comparison between the two applications.

A. Characteristics of Respondents

After distributing the questionnaire to 41 respondents who were targeted, namely employees at PT Bee Solution Partners using Google Form, 35 answers from 41 target respondents who had the characteristics as shown in Table 1 were collected.

TABLE 1. Characteristics of Respondents

		Qty	Percentage
1	Gender		
	Man	20	57.1%
	Woman	15	42.9%
2	Age		
	11-20 Years	1	2.9%
	21-30 Years	32	91.3%
	31-39 Years	2	5.8%

Figure 2 is a diagram image that shows the results of respondents' interest in choosing between which two applications they know better or use. The result of figure 2 is that respondents choose or know more about the Halodoc mobile application than the Alodokter application.

Manakah yang lebih sering anda pakai/ketahui
35 responses

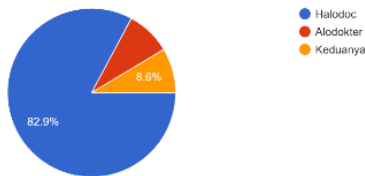


Fig. 2. Respondents' Results Based on Interests

B. Statement Indicator

TABLE 2. Questionnaire Statement Indicator

No.	Statement	SS	S	N	TS	STS
		5	4	3	2	1
Performance						
1	Halodoc app access speed is faster than Alodokter					
2	The menu displayed by Halodoc is more complete than Alodokter					
3	Halodoc display is easier for users to understand than Alodokter display					
4	The health store on Halodoc is more complete than the health store on Alodokter					

5	Location placement on Halodoc is more accurate than Alodokter					
6	Halodoc features are more interesting than Alodokter					
7	Account registration on Halodoc is easier than Alodokter					
8	Special Services on Halodoc are more complete than Alodokter					
9	Canceling drug orders on Halodoc is easier than Alodokter					
10	Alodokter app access speed is faster than Halodoc					
11	The menu displayed by Alodokter is more complete than Halodoc					
12	Alodokter's appearance is easier for users to understand than Halodoc's display					
13	The health store on Alodokter is more complete than the health store on Halodoc					
14	Location placement on Alodokter is more accurate than Halodoc					
15	Alodokter's features are more interesting than Halodoc					
16	Account registration on Alodokter is easier than Halodoc					
17	Special Services on Alodokter are more complete than Halodoc					
18	Canceling drug orders on Alodokter is easier than Halodoc					
Information/Data						
1	The article on Halodoc is more complete than Alodokter					
2	Halodoc's doctor profile information is more complete than Alodokter					
3	More promo information on Halodoc than Alodokter					
4	The article on Halodoc is more updated than Alodokter					
5	The article on Alodokter is more complete than Halodoc					
6	The doctor profile information on Alodokter is more complete than Halodoc					
7	More promo information on Alodokter than Halodoc					
8	The article on Alodokter is more updated than Halodoc					
Economics						
1	Halodoc doctor's tariff price is cheaper than Alodokter doctor's rate					
2	The price of drugs on Halodoc is cheaper than Alodokter					
3	The cost of delivering drugs to Halodoc is cheaper than Alodokter					
4	Halodoc application is more cost-effective than going to hospitals					
5	The price of doctor Alodokter is cheaper than Halodoc doctor's rate					
6	The price of drugs on Alodokter is cheaper than Halodoc					
7	The cost of delivering drugs to Alodokter is cheaper than Halodoc					
8	The Alodokter application is more cost-effective than going to the hospital					
Control/Security						
1	The security of personal data on Halodoc is more guaranteed than Alodokter					

2	Account creation on Halodoc requires account verification via OTP or email				
3	When logging in to Halodoc account, it requires OTP verification				
4	Halodoc application often experiences errors or bugs				
5	The security of personal data on Alodokter is more guaranteed than Halodoc				
6	Account creation on Alodokter requires account verification via OTP or email				
7	When logging in to an Alodokter account, it requires OTP verification				
8	The Alodokter application often experiences errors or bugs				
	Efficiency				
1	Halodoc application is more user friendly / easier than Alodokter				
2	Halodoc application is very helpful when patients cannot go to the hospital				
3	Halodoc application makes it easier for people				
4	The many options to login on Halodoc application				
5	Halodoc application provides benefits for users				
6	Alodokter application is more user friendly / easier compared to Alodokter				
7	The Alodokter application is very helpful when the patient is unable to go to the hospital				
8	The Alodokter application makes it easier for the public				
9	The many options to login on the Alodokter application				
10	The Alodokter application provides benefits for users				
	Service				
1	Doctors on halodoc application are more responsive than doctors in Alodokter				
2	Halodoc's helpdesk is faster to respond than Alodokter				
3	Insurance and protection options from companies are more Halodoc than Alodokter				
4	There are more payment methods on Halodoc than Alodokter				
5	Doctors on the Alodokter application are more responsive than doctors in Halodoc				
6	The helpdesk on Alodokter is faster to respond than Halodoc				
7	Insurance and protection options from companies are more Alodokter than Halodoc				
8	There are more payment methods on Alodokter than Halodoc				

comparison of the average level of satisfaction of Halodoc mobile application users as an example of taking data for the calculation of the average questionnaire in each domain.

TABLE 3. Halodoc Performance Questionnaire Data

Respondents	SS	S	N	TS	STS
1		9			
2	3	5	1		
3			9		
4		5	4		
5		9			
6	5	3	1		
7		3	6		
8	3	5	1		
9		9			
10	1	3	5		
11	3	2	4		
12	4	5			
13		9			
14		9			
15		5	4		
16	2	7			
17			9		
18			9		
19		6	3		
20		2	7		
21		4	5		
22	9				
23	2	5	2		
24	2	2	3	2	
25		3	4	2	
26	2	5	2		
27	4	5			
28		3	6		
29		9			
30		8		1	
31		7	2		
32		3	1	5	
33		9			
34			9		
35		9			

In the Halodoc Performance domain, it contains the performance of a system whether it runs well or not. This data is taken from the results of the questionnaire statement regarding the performance on the application.

TABLE 4. Halodoc Performance Domain Tabulation

Performance Halodoc					
Answer	SS	S	N	TS	STS
Score	5	4	3	2	1
Total	40	168	97	10	0

$$RK = \frac{JSK}{JK}$$

$$RK = \frac{(5 \cdot 40) + (4 \cdot 168) + (3 \cdot 97) + (2 \cdot 10) + (1 \cdot 0)}{40 + 168 + 97 + 10 + 0}$$

$$RK = \frac{1183}{315} = 3.76$$

Based on the results of the calculation of the average number of satisfaction levels obtained a value of 3.76 in the system performance domain (performance) and it can be concluded that the level of user satisfaction with the Halodoc application system is included in the SATISFIED category.

2. Alodokter Performance Indicator

The following are the results of questionnaire data on the

C. Calculation Result

Based on the results of the questionnaire assessment of application users in measuring service quality to user satisfaction by using the Likert Scale to determine the level of satisfaction of Halodoc and Alodokter mobile application users. The results of the questionnaire processing in seeing the level of customer satisfaction are as follows:

1. Halodoc Performance Indicators

The following are the results of questionnaire data on the Performance domain which is used to calculate the

Performance domain which is used to calculate the comparison of the average level of user satisfaction of the Alodokter mobile application as an example of data retrieval for the calculation of the average questionnaire in each domain.

TABLE 5. Alodokter Performance Questionnaire Data

Respondents	SS	S	N	TS	STS
1		1	5	3	
2	4	4	1		
3			9		
4		5	3	1	
5		9			
6			1	2	6
7		2	7		
8	1	8			
9		9			
10		7	2		
11			9		
12			9		
13			9		
14			9		
15		7	2		
16		5	4		
17			9		
18			9		
19			9		
20			4	5	
21			5	4	
22	9				
23		1	4	4	
24	2		7		
25		2	6	1	
26			6	3	
27		7	2		
28			5	4	
29		9			
30		9			
31			6	3	
32	1	8			
33			9		
34			9		
35		9			

In the Performance Alodokter domain, it contains the performance of a system whether it runs well or not. This data is taken from the results of the questionnaire statement regarding the performance on the application.

TABLE 6. Alodokter Performance Domain Tabulation

Performance Alodokter					
Answer	SS	S	N	TS	STS
Score	5	4	3	2	1
Total	17	102	160	30	6

$$RK = \frac{JSK}{JK}$$

$$RK = \frac{(5 \cdot 17) + (4 \cdot 102) + (3 \cdot 160) + (2 \cdot 30) + (1 \cdot 6)}{17 + 102 + 160 + 30 + 6}$$

$$RK = \frac{1039}{315} = 3.3$$

Based on the calculation results of the average number of satisfaction levels obtained a value of 3.3 in the system performance domain (performance) and it can be concluded that the level of user satisfaction with the Alodokter application system is included in the NEUTRAL category.

D. Overall Results

TABLE 7. Overall Calculation Results

No	Domain	Halodoc	Alodokter	Halodoc Description	Alodokter Description
1	Performance	3,76	3,3	SATISFIED	NEUTRAL
2	Information/Data	3,72	3,33	SATISFIED	NEUTRAL
3	Economics	3,68	3,43	SATISFIED	SATISFIED
4	Control & Security	3,44	3,51	SATISFIED	SATISFIED
5	Efficiency	3,93	3,8	SATISFIED	SATISFIED
6	Service	3,7	3,34	SATISFIED	NEUTRAL

The results of the overall calculation of the questionnaire on the two applications using the PIECES method and the Likert Scale, explained that the highest scores in the Halodoc and Alodokter applications were found in the Efficiency domain, namely 3.93 and 3.8. The lowest value in the Halodoc application is in the Control & Security domain, which is 3.44 and the Alodokter application is in the Performance domain, which is 3.3. Many respondents were dissatisfied with the Performance, Information/Data, and Service domains of the Alodokter application compared to Halodoc because in terms of respondents' interests and knowledge, more people used/knew the Halodoc application. Differences of opinion from some respondents, many are dissatisfied with the performance, information/data, and service domains, it does not mean that the Alodokter application is not good to use.

V. CONCLUSION & RECOMMENDATION

Based on the results of the research and discussion of the comparative analysis of the level of satisfaction with Halodoc and Alodokter mobile application users using the PIECES method, the following conclusions can be drawn:

- 1) Performance in the use of the Halodoc application received a SATISFIED rating with an average of 3.76 compared to the Alodokter application which received a NEUTRAL rating with an average of 3.3. This can be interpreted to mean that the system performance performance in the Halodoc application is better than the Alodokter application.
- 2) Information/Data in the use of Halodoc application received a SATISFIED rating with an average of 3.72 compared to the Alodokter application which received a NEUTRAL rating with an average of 3.33. This can be interpreted to mean that the accurate and up-to-date information on the Halodoc application is better than the information on the Alodokter application.
- 3) Economics in the use of the Halodoc and Alodokter applications received a SATISFIED assessment, it's just that the Halodoc application has a superior average value of 3.68 compared to the Alodokter application which got an average score of 3.43. This can be interpreted as saying that the two applications can make users save more on their economy, can also save time and effort, although respondents still choose that Halodoc has a higher average economic value.
- 4) Control and security (Control & Security) in the use of the Halodoc and Alodokter applications received a SATISFIED assessment, it's just that the Alodokter application has a superior average value of 3.51 compared

to the Halodoc application which got an average score of 3.44. This can be interpreted as both applications have system integrity, ease of access, and good security to support users in using the application, although respondents still choose that Alodokter has a higher control value.

- 5) Efficiency in the use of halodoc and Alodokter applications received a SATISFIED assessment, it's just that the Halodoc application has a superior average value of 3.93 compared to the Alodokter application which got an average score of 3.8. This can be interpreted as saying that both applications have a good level of efficiency to support users to save time and make it easier for users to run applications, although respondents still choose that Halodoc has a higher efficiency value.
- 6) The service in the use of halodoc application received a SATISFIED rating with an average of 3.7 compared to the Alodokter application which received a NEUTRAL rating with an average of 3.34. This can be interpreted to mean that Halodoc has a good service to support users to be easier to run applications compared to Alodokter.
- 7) Overall, the Halodoc application has a higher usability value compared to the Alodokter application.

Further development of halodoc and Alodokter applications to further improve Performance, Information/Data, Economics, Security, Efficiency, Service and also pay more attention to user needs, the addition of the "Video Call" feature to the application so that doctors can see the symptoms suffered by patients and can consult properly, not just through the conversation feature (chat) only. Meanwhile, the hope for further research can be done by increasing the number of respondents, using the Probability Sampling type, and using different methods to get accurate results, for example by using the Mobile Service Quality method which consists of 9 dimensions, namely, efficiency, system availability, content, privacy, fulfillment, responsiveness, compensation, contact, billing, and using the method Importance Performance Analysis (IPA) which is seen based on an assessment of the comparison between the performance of the services provided and the desired expectations based on customer perspectives.

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