

**Research Article**

# The Effect of Usability, Information Quality, and Service Interaction on E-Loyalty Mediated by E-Satisfaction on Hallobumil Application Users

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**Abstract.**

This research examines the effects of usability, information quality, and service interaction on e-loyalty mediated by e-satisfaction on Hallobumil application users. This study shows that usability, information quality, and service interaction on the Hallobumil application has a positive effect on user e-satisfaction. Meanwhile, usability and information quality variables don't directly effect but have a positive effect mediated by e-satisfaction. The service interaction variable has an effect on e-loyalty both directly and mediated by e-satisfaction.

**Keywords:** Usability, Information Quality, Service Interaction, E-Satisfaction, E-Loyalty.

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## 1. Introduction

Technology's rapid and dynamic development has a disruptive effect in all industry, including the health sector. Disruptive Innovation in the health sector gave birth to various internet-based medical services such as websites and health applications<sup>1</sup>. Along with the disruption in the health sector, the application of pregnancy is a new industry that is growing globally, especially in high-income countries<sup>2</sup>. There were 171 million internet users in Indonesia, 96% of them has internet access using smartphones in year 2020; Consumer behavior data shows 20% of the internet user access health services. As much as 51% of internet users in the health sector search for health information, including pregnancy<sup>3</sup>.

The COVID-19 pandemic has also accelerated the development of telemedicine in Indonesia. According to the Indonesian Pediatric Association, in August 2020, the incidence and mortality rate of COVID-19 in Indonesia was much higher than in other countries, namely 9.1% and 1.1%, respectively. The Minister of Health of the Republic of Indonesia, through Regulation number 46 of 2017 concerning the National e-Health

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Strategy, states that health services by utilizing information and communication technology called e-Health need to be carried out to improve the quality, accessibility, and sustainability of health services in Indonesia.

The Hallobumil application is the first interactive application in Indonesia that assists parents in preparing for pregnancy, pregnancy, and child development. Hallobumil provides information in a unique style as if parents are invited to chat with their children about their growth and development from the time they are in the womb until they are born into the world. Since its launch in 2016, this application has been downloaded by more than 1 million times on the Playstore with a rating value of 4.4 out of 5.

## 1.1. E-Service Quality

Santos<sup>4</sup> defines e-service quality as a comprehensive assessment of the quality of electronic services offered in the virtual market, including ease of use, interactive services, integrated, customer service, effective and efficiency, reliability, security, personal contact, website design, quality information, etc. Usability, information quality, and service interaction are widely studied dimensions that influence e-service quality<sup>5-8</sup>

Loiacono et al<sup>5</sup> states that usability is a quality related to website design, such as ease of use, navigation, appearance, and image conveyed to the user. Information quality is the quality of the content in the application, whether or not it is suitable for the user of the application, such as accuracy, relevance, and format<sup>5</sup>. The quality of information refers to the content presented on a website/application, as well as its suitability for user purposes in terms of correctness, format, and relevancy. A website/application must provide information that is simple to grasp for customers, provide up-to-date information and data, as well as reliable information for decision-making. The quantity and variety of information, the richness of the content, and the ease of navigation all contribute to the information quality. Meanwhile, Ilsever et al.<sup>9</sup> service interaction is the quality of service interaction experienced by users when using the application further, which is reflected by information security, product delivery, personalization, and communication.

## 1.2. E-Satisfaction

Given that the characteristics of online marketing competition are very tight and customers can move as quickly as a click, customer satisfaction is essential for online companies. Yusef<sup>10</sup> said that if a website/application does not meet expectations,

customers can quickly move from the website/application and look for other alternatives simply by clicking.

Anderson<sup>11</sup> associated e-satisfaction with a sense of liking, pleasure, or happiness. In the online context, satisfaction is defined as an affective state that indicates an emotional reaction in experiencing online activities<sup>12</sup>. Various studies have confirmed the positive relationship between e-service quality and e-satisfaction and its impact on e-loyalty<sup>7,11,13</sup>, so that companies need to measure customer satisfaction to get input in product and service development.

### 1.3. E-Loyalty

Chang & Chen<sup>14</sup> define e-loyalty as a discriminatory behavior of repurchasing a product, which is expressed every time by customers with an online store from a set of other online stores, which is a function of psychological decision-making and evaluative processes that result in a commitment. Anderson<sup>11</sup> also has the same opinion that e-loyalty is a positive attitude towards e-business in repeat purchase behavior. Cristobal<sup>7</sup> argues that to get e-loyalty, a service that can satisfy customers is needed.

Customer loyalty to a product or organization (e-health) will be built from social intimacy during interaction, customer appreciation (to virtual communication), and the desire to build meaningful relationships and dependencies<sup>15</sup>. If the quality interaction process with customers shows positive feelings and associations with customers, it will make customers loyal. Aryana & Winoto<sup>16</sup> explain that an individual who has loyalty and loyalty to something, then that person is willing to sacrifice for the things he believes in.

### 1.4. Conceptual Framework

The conceptual framework that explains the relationship between usability, information quality and interactive service on e-satisfaction and e-loyalty in this study can be illustrated in Figure 1 below.

Based on the conceptual framework above, the following hypotheses are formulated:

Hypothesis 1: Usability has a positive effect on e-loyalty

Hypothesis 2: Usability has a positive effect on e-satisfaction

Hypothesis 3: Information Quality has a positive effect on e-loyalty

Hypothesis 4: Information Quality has a positive effect on e-satisfaction.

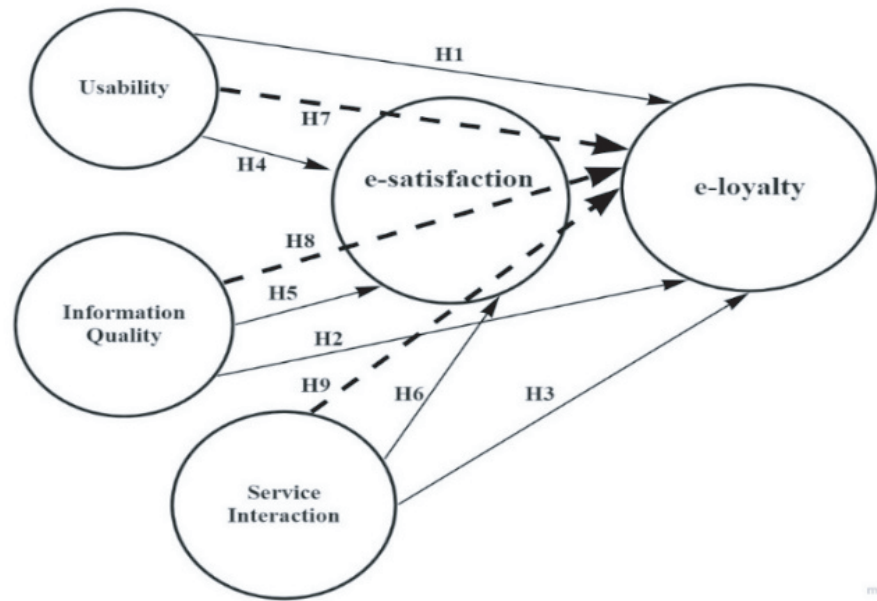


Figure 1: Conceptual Framework.

Hypothesis 5: Service Interaction has a positive effect on e-loyalty

Hypothesis 6: Service Interaction has a positive effect on e-satisfaction

Hypothesis 7: Usability has a positive effect on e-loyalty mediated by e-satisfaction.

Hypothesis 8: Information Quality has a positive effect on e-loyalty mediated by e-satisfaction

Hypothesis 9: Service Interaction has a positive effect on e-loyalty mediated by e-satisfaction

## 2. Method

Following the formulation of the problem and research objectives, the research used in this study uses a quantitative approach. Furthermore, the pattern of relationships between variables uses the path paradigm because intervening variables function as intermediate paths. This research was conducted on users of the Hallobumil application in Indonesia. The questionnaire distribution is done online using Google forms, where the link to the questionnaire can be accessed through the Hallobumil application. The data collection time is for one week, namely at the end of December 2020.

## 2.1. Population and Sample

In this study, the population used were all users of the Hallobumil application with the following inclusion criteria:

1. Live in the territory of Indonesia
2. Between 19-54 years old
3. Are in the period of preparation for pregnancy/pregnancy/child development
4. Have downloaded the Hallobumil application and used the application within the last month

The exclusion criteria applied are:

1. Age <19 years and >54 years
2. Have never used the Hallobumil application

Sampling as a research subject was done by the purposive sampling method. The sample size is determined by the rule of thumb, 5-10 times the number of indicators studied. If calculated, the ideal number of samples is 235-470 research samples. Researchers have selected and obtained appropriate and valid respondent data from the survey results as many as 460 respondents.

## 2.2. Data Collection and Analysis Techniques

The measurement of variables is carried out with a Likert scale from a range of 1 to 5. Number 1 indicates "Strongly Disagree (STS)," number 2 indicates "Disagree (TS)," number 3 indicates "neutral (N)," number 4 indicates "Agree (S)," number 5 indicates "Strongly Agree (SS)." The use of the Likert scale was chosen because it is easy, has high reliability in sorting subjects based on perception, is flexible, and is easy to apply to various situations.

The data obtained from the questionnaire was processed using Structural Equation Modeling (SEM). SEM analysis was carried out using SmartPLS, data processing software for SEM with the partial least squares (PLS) method. The choice of this software is due to its use providing leniency in the rules of use compared to other covariant-based SEM (CBSEM) alternatives, but does not ignore the rules related to validity, reliability, and accuracy in the practice of calculating data<sup>17</sup>. Data analysis was performed using

SmartPLS software which includes two stages of Goodness of Fit, namely the Outer Model (Measurement Model) and Inner Model (Structural Model).

### 2.3. Outer Model Evaluation

In the outer model (measurement model), validity testing (which includes convergent validity and discriminant validity) and reliability testing is carried out to ensure that the instruments used in the study are under research standards. According to Narimawati<sup>17</sup>, the validity test was conducted to determine the validity of the indicators that compose the latent variables. Convergent validity is a set of indicators that represent one latent variable and which underlies the latent variable. Convergent validity testing is carried out based on the principle that indicators of a construct should be highly correlated<sup>18</sup>. Convergent validity was tested by looking at the magnitude of the loading factor value for each indicator, with the expected value  $> 0.7$ . The convergent validity of a construct with reflective indicators was evaluated by Average Variance Extracted (AVE), with a value that should be  $> 0.5$ . The AVE value  $> 0.5$  illustrates that one latent variable can explain more than half the variance of its indicators in the average<sup>17</sup>.

Discriminant validity is an additional concept which means that two conceptually different concepts must show sufficient difference. Discriminant validity checks are carried out to determine whether the reflective indicator is a good measure of the construct based on the principle that each indicator must be highly correlated with its construct only. The measurement of discriminant validity uses the criteria presented by Fornell-Larckell and Cross Loading<sup>17</sup>.

Reliability testing is done by checking Internal Consistency Reliability using composite reliability and Cronbach Alpha. Composite Reliability is used to measure the real reliability value of a variable. In contrast, Cronbach's Alpha is used to measure the lowest value (lower bound) of the reliability of a variable. The composite reliability value of 0.6 – 0.7 is considered good reliability, and the expected Cronbach's Alpha value is above 0.7<sup>18</sup>.

### 2.4. Inner Model Evaluation

Q-square or predictive relevance to evaluate construct models. The inner model (Structural Model) is a model that relates latent variables. Measurements made on the inner model include R-square, F-square, Predictive Relevance, Model Fit, and hypothesis testing. The R-square value was tested to assess the magnitude of the influence of

certain independent latent variables on the latent dependent variable. Meanwhile, to determine the goodness of a model, the F-square examination is used. Then to see the suitability of a model, a Model Fit test is carried out, which has each parameter value, such as SRMR (Standardized Root Mean Residual), Chi-square, NFI, or Normal Fit Index. The next step is to check the significance of the relationship/influence between variables by looking at the path coefficient, which is reflected by the p-value<sup>17</sup>.

### 3. Result and Decision

#### 3.1. Characteristics of Respondents

The results of the questionnaire show the characteristics of the respondents as shown in Figure 2 below.

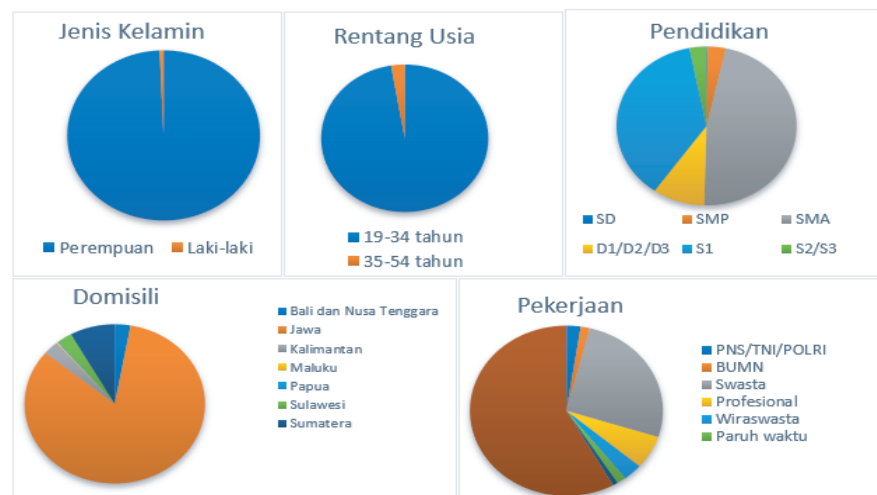


Figure 2: Characteristics of Hallobumil Respondents.

As an application that provides pregnancy services, the percentage of female respondents reaching 99.35% is very reasonable. This is consistent with the finding Hughson et al<sup>2</sup> that most users who access the pregnancy application are women. Most Hallobumil users are in the age range of 19-34 years (97.39%), which is the peak age of reproduction. In this age range, Hallobumil users are preparing for pregnancy, are pregnant, or are in the process of raising a child. In terms of education level, it can be seen that most Hallobumil users have a high school education background or equivalent, S1, and D1/D2/D3 with a percentage of 46.96%, 37.17%, and 9.35%, respectively. This is following the findings that pregnancy applications are related to technology, health literacy, and language problems<sup>2</sup>.

Java Island still dominates the distribution of Hallobumil application users (83.04%). They are then followed by Sumatra (8.04%), Bali and Nusa Tenggara (3.04%), Kalimantan (2.83%), Sulawesi (2.61%), and the rest (below 1%) on the islands of Maluku and Papua. Compared with the results of a survey conducted by the Indonesian Internet Service Providers Association (APJII)<sup>19</sup> in 2019-2020, the results are not so different. The job characteristics show that Hallobumil users (primarily women) work as housewives (58.04%). The second largest is working as Private Employees (25.09%), followed by Professionals (Doctors, Teachers, Lawyers, Psychologists, etc.), Entrepreneurs, Civil Servants/TNI/POLRI, and BUMN Employees.

### 3.2. Outer Model Evaluation -- Validity Test

The convergent validity is tested by looking at the magnitude of the loading factor value for each indicator, which is expected to be > 0.7. A reflective indicator must be eliminated from the measurement model when the loading factor value is less than 0.7. Figure 3 below is the result of a convergent validity test with a loading factor value above 0.7, which indicates that all indicators are valid.

Convergent validity is carried out to determine whether a set of indicators represents one latent variable and underlies the latent variable. This value can be determined by looking at the average value of the extract variant (Average Variance Extracted, AVE) with a value of > 0.5. In Table 1 below, all AVE values are above 0.5, which explains that one latent variable can explain more than half the variance of its indicators on average.

TABLE 1: Average Variance Extracted.

	Average Variance Extracted
Usability	0,584
information quality	0,582
service interaction	0,629
e-loyalty	0,671
e-satisfaction	0,832

Measurement of discriminant validity using Fornell-Larcker and Cross Loadings criteria. The Fornell-Larcker criteria are seen from the AVE value for each latent variable which must be higher than the R-square with all other latent variables. The results of the calculation of the Fornell-Larcker Criteria are presented in Table 2 below.

Another discriminant validity test measures the loading value for each indicator which is higher than its 'cross loading'. The results show that all indicators that make up the variables in this study have met discriminant validity because they have the most



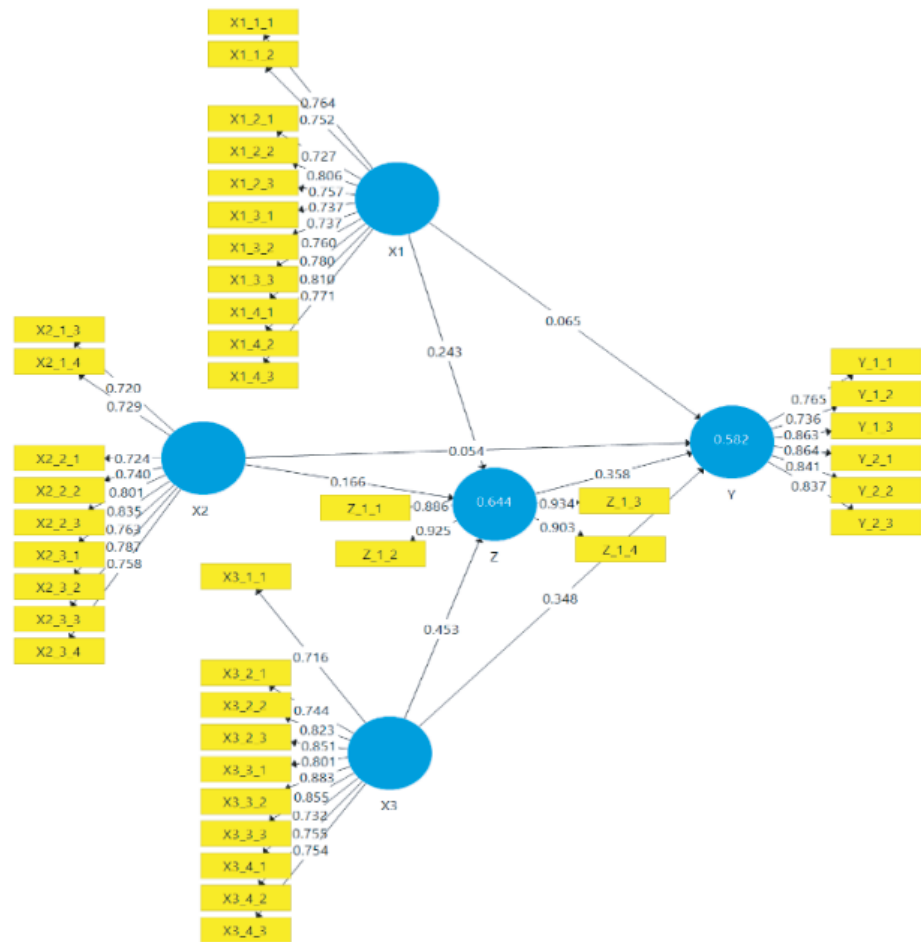


Figure 3: Path Diagram with loading factor value.

TABLE 2: Fornell-Larcker Criteria.

	X1	X2	X3	Y	Z
Usability	0,764				
information quality	0,803	0,763			
service interaction	0,729	0,847	0,793		
e-loyalty	0,616	0,668	0,718	0,819	
e-satisfaction	0,706	0,745	0,771	0,713	0,912

significant outer loading value for the variables they form and not for other variables. So, it can be said that all indicators in each variable have met discriminant validity.

### 3.3. Outer Model Evaluation -- Reliability Test

The reliability test was carried out using the Composite Reliability test (with the expected value > 0.7 and Cronbach's Alpha (with the expected value > 0.6). Table 3 below shows

TABLE 3: Reliability Test.

	Cronbach's Alpha	Composite Reliability
Usability	0,929	0,939
information quality	0,910	0,926
service interaction	0,934	0,944
e-loyalty	0,903	0,924
e-satisfaction	0,933	0,952

the results that follow the expected value. All constructs or latent variables have a value > 0.5. From this test, it can be concluded that all construct indicators are reliable or meet the reliability test.

### 3.4. Inner Model Evaluation

In the inner model testing, R-square, F-square, Predictive Relevance, Model Fit, and hypothesis testing were carried out. The test results show the R-square value for the Z variable (e-satisfaction) of 0.642, which means that 64.2% of the e-satisfaction (Z) variable is influenced by the variables X1 (Usability), X2 (information quality), and X3 (service) and variable Y (e-loyalty). Other constructs outside the study influence the remaining 35.8%. The R-square value for the Y variable is 0.578, which indicates that 57.8% of the Y variable (e-loyalty) is influenced by the variables X1 (usability), X2 (information quality), and X3 (service interaction). While the rest, 42.2%, is influenced by other variables outside of this study. As for the F-Square value, the variables X1 (usability) and X2 (information quality) on Y are categorized as weak, while the X3 (service interaction) variables on Y are categorized as vital. The influence of the variables X1, X2, and X3 on Z is categorized as vital.

TABLE 4: F-Square.

	Usability	Information Quality	Service Interaction	E-loyalty	E-satisfaction
Usability				0,003	0,057
Information Quality				0,001	0,016
Service Interaction				0,069	0,159
E-loyalty					
E-Satisfaction				0,109	

Based on the calculation results, obtained a Q-square value of 0.851 which indicates that the exogenous latent variable has accurate predictive relevance.

Based on Table 5 below, the Model Fit measurement is obtained with an SRMR value of 0.016 (less than 0.1 or 0.08) and an NFI value of 0.795 (close to 1), which indicates a more suitable model. While the Chi-square value of 3250,733 (more than 3) indicates a less suitable model.

TABLE 5: Goodness of Fit Model.

	Saturated Model	Estimated Model
SRMR	0,061	0,061
d_ULS	3,037	3,037
d_G	1,251	1,251
Chi-Square	3250,733	3250,733
NFI	0,795	0,795

### 3.5. Hypothesis Test -- Direct Influence

To perform the Path Coefficient test, p-value < 0.05 is considered significant, while p-value > 0.05 is considered insignificant. Based on the calculation results, there are two insignificant relationships seen from p-values > 0.05, namely the effect of Usability on e-loyalty (X1 Y) and the effect of Information Quality on e-loyalty (X2 Y).

TABLE 6: Path Coefficient.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Usability E-loyalty	0,065	0,079	0,078	0,834	0,405
Usability E-satisfaction	0,243	0,249	0,086	2,840	0,005
Information Quality E-loyalty	0,054	0,052	0,083	0,649	0,517
Information Quality E-satisfaction	0,166	0,162	0,070	2,380	0,018
Service Interaction E-loyalty	0,348	0,349	0,076	4,608	0,000
Service Interaction E-satisfaction	0,453	0,452	0,067	6,802	0,000

The magnitude of the direct influence of exogenous variables on endogenous variables provided in Table 6 above shows the results of testing the hypothesis of this study.

1. Hypothesis 1: Usability has a positive and significant effect on e-loyalty. If the p-value of 0.405 is greater than the significance value (0.05), the hypothesis is rejected. So that usability does not have a positive and significant effect on e-loyalty.
2. Hypothesis 2: Usability has a positive and significant effect on e-satisfaction. If the p-value of 0.005 is smaller than the significance value (0.05), the hypothesis is accepted. Thus, usability has a positive and significant effect on e-satisfaction.
3. Hypothesis 3: Information Quality has a positive and significant effect on e-loyalty. If the p-value of 0.517 is greater than the significance value (0.05), the hypothesis is rejected. Thus, information quality has no positive and significant effect on e-loyalty.
4. Hypothesis 4: Information Quality has a positive and significant effect on e-satisfaction. The p-value of 0.018 is smaller than the significance value (0.05), then the hypothesis is accepted. Thus, information quality has a positive and significant effect on e-satisfaction.
5. Hypothesis 5: Service Interaction has a positive and significant effect on e-loyalty. The p-value of 0.000 is smaller than the significance value (0.05), then the hypothesis is accepted. Thus, service interaction has a positive effect on e-loyalty.
6. Hypothesis 6: Service Interaction has a positive and significant effect on e-satisfaction. The p-value of 0.000 is smaller than the significance value (0.05), then the hypothesis is accepted. Thus, service interaction has a positive effect on e-satisfaction.

### 3.6. Hypothesis Test -- Indirect Influence

In addition to the direct effect, the role of the mediating variable was also tested to see the position of the intervening variable (e-satisfaction) in the model. The results of the mediation test can be seen in Table 7. The results show that all variables have a significant effect on e-loyalty mediated by e-satisfaction.

The results of the mediation influence analysis are as follows:

1. Hypothesis 7: Usability has a positive and significant effect on e-loyalty mediated by e-satisfaction. If the p-value of 0.002 is smaller than the significance value (0.05), the hypothesis is accepted. Thus, usability has a positive and significant effect on e-loyalty mediated by e-satisfaction.

TABLE 7: Indirect Effect.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Usability E-loyalty	0,087	0,084	0,029	2,959	0,003
Information Quality E-loyalty	0,059	0,057	0,030	2,015	0,044
Service Interaction E-loyalty	0,162	0,157	0,041	3,948	0,000

2. Hypothesis 8: Information Quality has a positive and significant effect on e-loyalty mediated by e-satisfaction. If the p-value of 0.047 is smaller than the significance value (0.05), the hypothesis is accepted. Thus, Information Quality has a positive and significant effect on e-loyalty mediated by e-satisfaction.
  
3. Hypothesis 9: Service Interaction has a positive and significant effect on e-loyalty mediated by e-satisfaction. The p-value of 0.000 is smaller than the significance value (0.05), then the hypothesis is accepted. Thus, Service Interaction has a positive and significant effect on e-loyalty mediated by e-satisfaction.

### 3.7. Effect of Usability on e-Loyalty

The analysis results show that usability does not positively affect increasing the e-loyalty of Hallobumil application users. The usability variable that does not directly affect e-loyalty indicates that users do not set the ease of using the Hallobumil application as a benchmark for loyalty in using the application. This finding also occurs in a study conducted by Flavian<sup>20</sup>, which states that the effect of the degree of usability on customer loyalty does not have a direct relationship. Similar applications with a usability level similar to or even higher than Hallobumil can cause usability not to affect loyalty directly. Users can easily switch to similar applications if there are difficulties or complicated things in using an application.

### 3.8. Effect of Usability on e-Satisfaction

The analysis results show that usability has a positive and significant effect on customer e-satisfaction with the Hallobumil application. The better the usability or ease of use of the Hallobumil application, the higher customer satisfaction (e-satisfaction). The results show that the e-service quality (one of which is represented by the design or appearance dimensions) affects e-satisfaction. The results of this study are in accordance with

research conducted by Loiacono et al<sup>5</sup> and Parasumaran et al<sup>6</sup> that focused on the development of tools for measuring usability and satisfaction dimensions.

### **3.9. Effect of Information Quality on e-Loyalty**

As with usability (which is also the dimension of e-service quality), the analysis results also show that information quality does not have a significant effect on e-loyalty. This insignificant relationship between information quality and e-loyalty indicates that users do not set the quality of information on the application as a benchmark for loyalty in using the application. When viewed from the data on the characteristics of respondents, most (47%) of respondents have a high school education background or equivalent and work as housewives (58%). With these characteristics, there is a tendency for respondents not to use writing quality such as accuracy, relevance, and format as a measure of loyalty. This finding also occurred in a study conducted by Berliana<sup>21</sup> on the effect of e-service quality on customer satisfaction and loyalty to Go-Pay users in Indonesia. According to the research, e-Service quality in the Go-Pay application does not affect customer loyalty.

### **3.10. Effect of Information Quality on e-Satisfaction**

Although the quality of information does not significantly affect loyalty, based on the results of the analysis, information quality has a positive and significant effect on e-satisfaction. This means that the better the information quality in the application, the higher the e-satisfaction of Hallobumil users. Alternatively, it also reflects that the high information quality of users of the Hallobumil application can support variations in changes in increasing e-satisfaction. These findings strengthen the research findings of Prasetyo<sup>22</sup> on the effect of the quality of electronic services and the quality of information on the Alodokter application on user satisfaction for students of the Faculty of Medicine, University of Riau. The study results stated that e-service quality in the form of quality information in the Alodokter application had a positive effect on user satisfaction.

### **3.11. Effect of Service Interaction on e-Loyalty**

The results of the analysis show that the service interaction in the Hallobumil application has a positive and significant effect on the e-loyalty of its users. The better the service interaction, the more e-loyalty of users of the Hallobumil application will increase. This

study reinforces the research conducted in Pakistan by Mukaram<sup>23</sup>, which examined the effect of e-service quality (represented by privacy/security) of online shopping on e-loyalty. The results show that e-service quality has a positive effect on customer e-loyalty.

### **3.12. Effect of Service Interaction on e-Satisfaction**

The analysis results show that the service interaction in the Hallobumil application has a positive and significant effect on e-satisfaction users. A good service interaction will increase the e-loyalty of Hallobumil application users. This also reflects that high service interaction can support various changes in increasing e-satisfaction of Hallobumil application users. This finding strengthens the research conducted by Mukaram<sup>23</sup> in Pakistan on the effect of e-service quality on online shopping on e-satisfaction and e-loyalty of customers. In addition to showing a positive effect on e-loyalty, this study also shows that e-service quality (reflected by security indicators) has a positive effect on e-satisfaction.

### **3.13. The Effect of Usability on e-Loyalty by Mediating e-Satisfaction**

The results showed that usability had a significant and positive effect on e-loyalty mediated by e-satisfaction. As part of e-service quality, usability is the initial home page for users to enjoy application services. Usability indicators such as ease of operation, navigation, and display design, have succeeded in providing satisfaction and comfort to customers (e-satisfaction), which makes customers loyal to use the application and recommend it to others (e-loyalty). These findings support the research conducted by Nasution<sup>24</sup>, which states that e-service quality (in this case, the ease of use of the OVO application) has a positive and significant effect on e-loyalty mediated by e-satisfaction.

### **3.14. Effect of Information Quality on e-Loyalty with e-satisfaction mediated**

The analysis results that tested the effect of information quality on e-loyalty mediated by e-satisfaction showed significant and positive results. This shows that the quality of the information provided by the Hallobumil application first gives satisfaction to its customers, and then it makes customers loyal. Information quality does not directly

influence customer loyalty, but customers become loyal after being satisfied with the information quality provided. This finding also strengthens the research conducted by Riza<sup>25</sup>, which shows that the quality of information on the Lazada website has a positive and significant influence on e-satisfaction and e-loyalty. This means that the better and more relevant information obtained by customers through the Lazada website, the greater the satisfaction and customer loyalty.

### **3.15. Effect of Service Interaction on e-Loyalty with e-satisfaction Mediated**

The results show that service interaction has a positive and significant effect on e-loyalty, mediated by e-satisfaction. The results of this study strengthen the research conducted by Ilham<sup>26</sup>, which shows that e-service quality – reflected by security (maintained security), communication (easy to communicate), and deliverables (delivered products) – an online food delivery application has a positive effect on e-loyalty by mediated e-satisfaction. This study explains that e-service quality and e-satisfaction are the primary keys to the emergence of e-loyalty. The better the service quality of an application will determine the loyalty of its users, which comes from their satisfaction using the application.

## **4. Conclusion**

Based on the findings and discussion of the research, some conclusions can be drawn as follows:

1. Usability, information quality, and service interaction have a positive and significant effect on the e-satisfaction of users of the Hallobumil application. Meanwhile, only service interaction has a positive and significant effect on e-loyalty.
2. Not found sufficient evidence to support the positive and significant effect of usability on e-loyalty of Hallobumil users. This finding means that usability is not a variable that contributes directly to the e-loyalty of Hallobumil users. However, usability must still be considered because, with e-satisfaction mediation, usability becomes a positive and significant effect on e-Loyalty. This finding means that the information quality variable is not a variable that contributes directly to the e-loyalty of Hallobumil application users.



3. Not sufficient evidence supports the positive and significant effect of information quality on the e-loyalty of users of the Hallobumil application. However, information quality must still be considered because, with e-satisfaction mediation, information quality will positively and significantly affect e-Loyalty.
4. Usability, information quality, and service interaction have a positive and significant effect on e-loyalty mediated by e-satisfaction. Without the mediating variables, e-satisfaction, usability, and information quality do not contribute directly to e-loyalty.

Based on the findings and conclusions of the study, some suggestions can be given that can be recommendations for both Hallobumil application managers and future research, as follows:

1. The Hallobumil application manager is expected to continue to improve the usability of the Hallobumil application, which is reflected in the ease of use (ease of operation), navigation (easy to search), appearance (attractive appearance/design), and image conveyed to the user (the effortless experience that reaches the user). Users) so that this variable can make a positive and significant contribution directly not only to e-satisfaction but also to e-loyalty users.
2. The Hallobumil application manager is expected to continue to improve the information quality of the Hallobumil application, which is reflected inaccuracy, relevance, and attractive writing format, so that this variable can make a positive and significant contribution directly, not only for e-satisfaction but also to e-loyalty users.
3. The next researcher can develop and use the variable measurement model in this study as an evaluation method for the mitigation carried out by the Hallobumil application developer based on the results and findings of this study.
4. The next researcher can develop and use the variable measurement model in this study on other research objects, especially in similar pregnancy/health application services, to test the accuracy and accuracy of the model in online-based application services.

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