Available online at: http://jurnal.untirta.ac.id/index.php/jiss

JOURNAL INDUSTRIAL SERVICESS

Industrial Engineering Advance Research & Application

eISSN 2461-0631

A comparative study on e-wallet user perceptions: Pre- and post-COVID-19 analysis using e-SERVQUAL

Nuraida Wahyuni*, Zahran Fauzan, Akbar Gunawan , Shanti Kirana Anggraeni, Evi Febianti, Ratna Ekawati

Department of Industrial Engineering, Universitas Sultan Ageng Tirtayasa, Jl. Jend. Sudirman KM 3, Cilegon 42435, Banten, Indonesia

ARTICLE INFO

Article history:
Received 1 February 2023
Received in revised form 16 March 2023
Accepted 31 March 2023
Available online 31 March 2023

Keywords:
e-servqual
e-wallet
Paired sample t-test
Perception

Editor:
Bobby Kurniawan

Publisher's note:
The publisher remains neutral concerning jurisdictional claims in published maps and institutional affiliations.

ABSTRACT

The use of e-wallets in Indonesia has been developing since their emergence in 2011. The circulation of electronic money has been increasing, particularly in urban areas, due to the rising digital literacy of people. However, there was a significant increase during the Covid period when restrictions were imposed on community activities to prevent the spread of the virus. During this period, the circulation of electronic money more than doubled from the previous year. The perception of e-wallet users is crucial as it provides valuable information about their expectations and preferences. This information helps e-wallet providers determine whether their products or services meet the users' expectations. The e-SERVQUAL method is used to measure e-wallet user perceptions, which evaluates the quality of electronic services provided by companies through electronic media. Therefore, this study aims to investigate whether there is a significant difference in e-wallet user perceptions using e-SERVQUAL before and after the Covid period. The survey method was used in this study. The results showed a significant difference between users' perceptions before and after the Covid period with a significance value below 0.05.

1. Introduction

E-wallets first appeared in Indonesia around 2011, with several applications developed by technology and financial companies [1]. Since then, the use of e-wallets in Indonesia has experienced significant growth, particularly from 2016 onwards. In 2020, the use of e-wallets in Indonesia experienced an even greater increase due to the COVID-19 pandemic, which has driven changes in how people shop and transact digitally [2].

Measuring consumer perceptions is very important for companies because it can provide information about what consumers say or expect about the products or services offered [3]. Measuring consumer perceptions can help companies evaluate marketing strategies, improve product or service quality, and develop new products better suited to consumer needs [4]. Thus, measuring consumer perceptions can help companies increase consumer satisfaction and loyalty [5].

It is essential to know Indonesian consumers' perceptions of using e-wallets. Consumer perceptions will influence their decision to use or not use e-wallets and how they use them. If consumer perceptions are negative, this can hinder the development and spread of e-wallets in Indonesia. Conversely, positive consumer perceptions can accelerate the development and spread of e-wallets in Indonesia. Therefore, it is crucial for companies that provide e-wallets to understand consumer perceptions and take the necessary actions to improve these consumer perceptions.

E-servqual can be used to measure e-wallet user perceptions. E-servqual is a method used to measure the quality of electronic services (e-service quality) used by companies in providing services through electronic media. This method was developed from the servqual method, which measures the quality of physical services [6], [7]. E-servqual measures the quality of e-wallet services from a consumer's point of view by measuring the difference between consumer expectations of e-wallet services and the actual performance of the e-wallet service.

Testing differences in perceptions of e-wallet users in Indonesia before and after the COVID-19 pandemic is vital to understand how the pandemic has affected consumer perceptions and preferences for e-wallet usage. This test can help companies that provide e-wallets to find out how the pandemic has affected consumers' decisions to use or not use e-wallets and

*Corresponding author:
Email: n.wahyuni@untirta.ac.id

http://dx.doi.org/10.36055/jiss.v9i1.19060

how they use them. The results of this test of differences in perceptions can also use to determine more effective marketing and product development strategies to meet changing consumer needs and preferences.

Most e-wallet users in Indonesia are in the younger age range, 18-30 years old [8]. At this age, most people have easier access to technology and are more open to new technological innovations. In addition, the younger generation tends to be more active in making online transactions and more comfortable using mobile applications than the older generation.

Therefore, this study aims to find differences in perceptions of e-wallet users based on the e-servqual dimension. Respondents are in the age group of 18-30 years. This study is limited to paired t-tests on each dimension, not carrying out further tests such as Tukey's or Scheffe's tests.

2. Method

The survey method was used in this study, with a questionnaire consisting of closed questions based on the e-servqual dimensions and open questions regarding user expectations for e-wallet performance. A total of 150 questionnaires were distributed to young people who actively use e-wallets in transactions, and respondents filled out the questionnaires according to their perceptions of the e-wallets they used from various providers before and after the COVID-19 pandemic.

The e-servqual dimensions describe respondents' perceptions of the e-wallets they use, including the fulfillment dimension, efficiency dimension, system availability dimension, security and privacy dimension, and compensation dimension.

The fulfillment dimension refers to the e-wallet's function to facilitate transactions, while the efficiency dimension refers to real-time payments. The system availability dimension refers to e-wallets that can be used to pay various merchants, while security and privacy refer to the security of an e-wallet account, which should have a robust security system and use encryption to protect users' personal and financial information. Finally, the compensation dimension refers to e-wallets that offer promotions and discounts for users.

Each indicator in each dimension can be seen in Table 1, which is based on various sources such as Alawneh [9], Sikdar [10], Asad [11], and Toor [12], along with some indicators obtained from the author's observations and experiences.

The data that has been collected is then tested for normality of the data. The normality test in this study used the Kolmogorov-Smirnov test. If the data is normally distributed, proceed with the paired t-test for each dimension in the pre-covid and post-covid conditions. The hypothesis in this study are:

1. H_{01}: there is no significant difference between the pre-covid e-servqual perception of e-wallet and post-covid e-servqual perception of e-wallet dimensions.
2. H_{02}: there is no significant difference between the pre-covid fulfillment and post-covid fulfillment dimensions.
3. H_{03}: there is no significant difference between the pre-covid efficiency and post-covid efficiency dimensions.
4. H_{04}: there is no significant difference between the pre-covid system availability and post-covid system availability dimensions.

Table 1.
Indicator of the e-servqual dimension

Dimension	Indicator
Fulfilment	E-Wallet provides convenience in online or digital payment transactions.
	E-Wallet provides precise and accurate payment services.
Efficiency	Loading times when logging into the E-Wallet application are fast.
	Using E-Wallet services saves time.
	E-Wallet balance top-up can be done anywhere and anytime.
	The services provided through E-Wallet services are fast.
	Various transactions can be completed quickly through E-Wallet services.
	E-Wallet service is easy to use.
	E-Wallet system is easy to learn.
	The interaction with the E-Wallet system is clear and easy to understand.
	The E-Wallet system is flexible to interact with.
System availability	E-Wallet transactions can be done anywhere and anytime.
	E-Wallets can be used to make transactions with the merchant.
	E-Wallet can be used to make payments for electricity bills, water bills and internet bills.
	E-Wallet can be used to make payments for paid applications such as netflix, spotify, youtube premium, etc.
	E-Wallets can be used to make online shopping payments.
	E-Wallet can be used to top-up credit and data packages.
	E-Wallet can be used to pay for insurance.
	E-Wallets can be used to make interbank transfers.
Security and privacy	E-Wallet services provide high protection for every transaction.
	E-Wallet users' personal information data security is maintained and protected.
	The E-Wallet service does not allow others to access my account.
	E-Wallet services are guaranteed and safe from any fraud or hacking.
	Transactions using e-wallets are safe.
Compensation	E-Wallets provide promos in the form of discount vouchers.
	E-Wallet provides cashback.

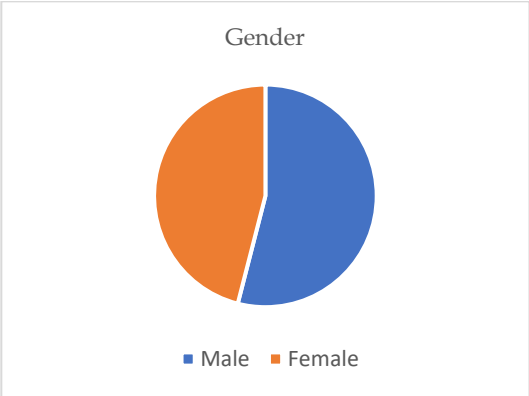

Figure 1. Respondent's gender

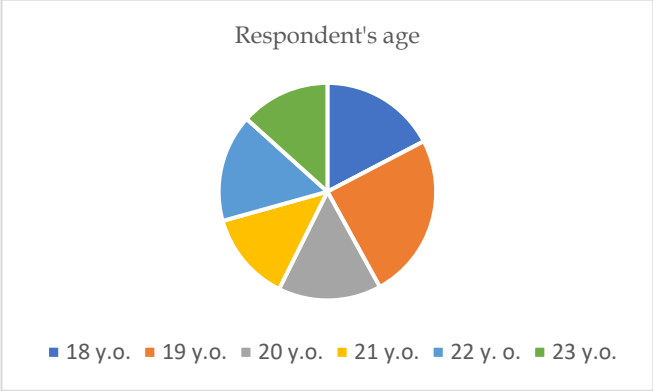

Figure 2. Respondent's age

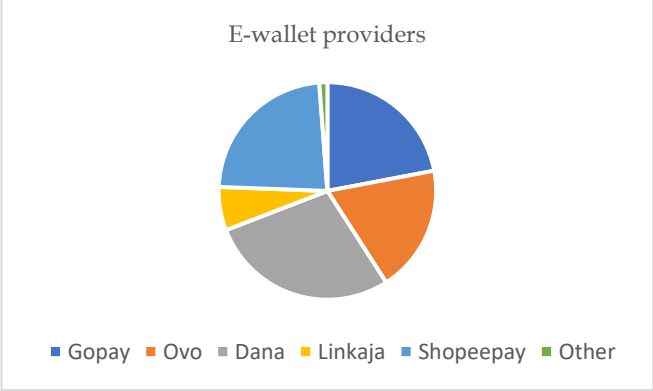

Figure 3. E-wallet providers

5. H_{05}: there is no significant difference between the pre-covid security and privacy and post-covid security and privacy dimensions.
6. H_{06}: there is no significant difference between the pre-covid compensation and post-covid compensation dimensions.

3. Results and discussions

There were more male respondents than female respondents. As shown in Figure 1 and Figure 2, 54% of male and 46% of female respondents. In terms of age, 25% of the respondents were 19 years old, 17% of the respondents were 18 years old, 16% of the respondents were 22 years old, 15% of the respondents were 20 years old, and 14% of the respondents were 21 years old, and 13% of the respondents were 23 years old. The respondents used e-wallet providers consisted of 28% of Dana users, 22% of Shopeepay users, 21% of Gopay users, 18% of Ovo users, 6% of Linkaja users, and 5% of others using other e-wallets, as shown in Figure 3.

In this study, data processing was carried out using SPSS. The Kolmogorov-Smirnov test was used to test the normality of the data, and the results are presented in Table 2. The asymptotic significance value was 0.000 for the condition before Covid and 0.200 for the condition after Covid. The significance level used in this study was 0.05. In the condition before Covid, the sigma value was less than the significance level, which typically indicates abnormal data. However, according to Pallant's research [13], if the sample size is greater than 40, non-normality is less of an issue and researchers can still use parametric procedures [14]. In the condition after Covid, the sigma value was greater than the significance level, indicating that the data was normally distributed. The result of paired samples statistics shown in Table 4.

Table 2.
Kolmogorov-Smirnov test

		Before	After
N		150	150
Normal Parameters[a,b]	Mean	4.15718	4.33180
	Std. Deviation	0.276630	0.414979
Most Extreme Differences	Absolute	0.115	0.060
	Positive	0.074	0.054
	Negative	-0.115	-0.060
Test Statistic		0.115	0.060
Asymp. Sig. (2-tailed)		.000[c]	.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Table 3.
Paired samples statistics (N = 150)

Pair	Mean	Std. Deviation	Std. Error Mean
1	4.15718	0.276630	0.022587
	4.33180	0.414979	0.033883
2	4.59667	0.455012	0.037152
	4.67333	0.456080	0.037239
3	4.26739	0.303021	0.024742
	4.31037	0.462590	0.037770
4	3.95917	0.469832	0.038362
	4.44333	0.499703	0.040801
5	4.10533	0.514330	0.041995
	4.00933	0.699889	0.057146
6	4.14333	0.782220	0.063868
	4.44667	0.673433	0.054986

Table 4.
Paired samples correlations

Pair	Correlation	Sig.
1	0.177	0.030
2	0.113	0.169
3	0.096	0.245
4	0.123	0.133
5	0.036	0.662
6	-0.001	0.987

Table 5.
Paired samples test

Pair	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
1	-0.174617	0.456167	0.037246	-0.248215	-0.101018	-4.688	149	0.000
2	-0.076667	0.606831	0.049548	-0.174573	0.021240	-1.547	149	0.124
3	-0.042979	0.528236	0.043130	-0.128205	0.042247	-0.996	149	0.321
4	-0.484167	0.642343	0.052447	-0.587803	-0.380531	-9.232	149	0.000
5	0.096000	0.853487	0.069687	-0.041702	0.233702	1.378	149	0.170
6	-0.303333	1.032844	0.084331	-0.469973	-0.136693	-3.597	149	0.000

Pair 1 is the e-servqual variable before covid and after covid. Pair 2 is the fulfillment variable before covid and after covid. Pair 3 is the efficiency variable before covid and after covid. Pair 4 is the system availability variable before covid and after covid. Pair 5 is the security and privacy variable before and after covid. Pair 6 is the compensation variable before and after covid.

The results of the paired samples correlations shown in Table 4 reveal a weak correlation. The purpose of the paired sample correlation is to test whether there is a relationship between two variables observed at different times or conditions from the same subject [15]. This can help in understanding the relationship between the variables and provide clues on how they may affect each other. A correlation value between -1 and 1, which is not equal to 0, indicates a linear relationship between the two variables. However, the greater the value, the stronger the relationship. Therefore, pairs 1 to 6 exhibit a linear but weak correlation. The output in Table 5 answers the statements in the six hypotheses in this study. According to Berkman [15], if the Sig. (2-tailed) < 0.05, then, H_0 is rejected and H_a is accepted. Conversely, if the Sig. (2-tailed) > 0.05, then H_0 is accepted and H_a is rejected.

The *t*-count value is negative (-4.688), and the sig. (2-tailed) value, which is very small (0.000), indicates that there is a significant difference between the perceived e-servqual variables of e-wallet users before and after the COVID-19 pandemic. The null hypothesis (H_{01}), which states that there is no difference in the perception of e-servqual to e-wallet before and after COVID-19, is rejected. This means that there is a significant difference between e-servqual perceptions of e-wallets before and after COVID-19, and there is an influence on the perception of e-servqual towards e-wallet before and after COVID-19 [16]. E-wallet providers can utilize this finding to improve their services.

The *t*-count value is negative (-1.547), and the sig. (2-tailed) which is not so small (0.124) indicates that there is no significant difference between fulfillment variables before and after the covid pandemic. The null hypothesis (H_{02}) stating that there is no difference in fulfillment before and after covid is accepted. This means that the perception of fulfillment before and after covid remains the same. Users feel the convenience of digital transactions and feel the precision and accuracy of services when making payments that are as good before the covid period as after covid [17]. E-wallet service providers can continue to maintain their performance.

The *t*-count value is negative (-0,996), and the sig. (2-tailed) which is not so small (0.321) indicates that the difference between efficiency before and after the covid pandemic is not significant. The null hypothesis (H_{03}) about there is no difference in efficiency before and after covid. That is, there is no significant difference between efficiency before and after covid. In this case, efficiency can contribute to the overall improvement of e-wallet service quality. By improving efficiency, companies can reduce loading times, make the e-wallet system more flexible, and increase the ease of use of e-wallets. This can increase the satisfaction of e-wallet users and increase their loyalty towards the company [18]. Therefore, efficiency can serve as an important factor in improving the overall quality of e-wallet services.

The *t*-count value is negative (-9,232), and the sig. (2-tailed) is very small (0.000) indicates that the difference between system availability before and after the covid pandemic is significant. The null hypothesis (H_{04}) about there is no difference in system availability before and after covid. That is, there is a significant difference between system availability before and after covid. Therefore, it is important for e-wallet service provider companies to ensure consistent availability of their systems and monitor their system performance regularly. By ensuring good system availability, companies can increase user trust, increase user loyalty, and strengthen their position in the market [19]. In this case, system availability plays an important role in ensuring the success of the e-wallet business and improving the quality of services provided by the company.

The *t*-count value is positif (1.378), and the sig. (2-tailed) which is not so small (0.170) indicates that the difference between security and privacy before and after the covid pandemic is not significant. The null hypothesis (H_{05}) about there is no difference in security and privacy before and after covid. That is, there is no significant difference between efficiency before and after covid. By ensuring good security and privacy, e-commerce companies can increase consumer trust and strengthen their relationships with customers [20]. This can help increase customer loyalty, improve customer retention, and enhance the company's overall image.

The *t*-count value is negative (-3.597), and the sig. (2-tailed) is very small (0.000) indicates that the difference between compensation before and after the covid pandemic is significant. The null hypothesis (H_{06}) about there is no difference in compensation before and after covid. That is, there is a significant difference between compensation before and after covid. Compensation can play an important role in improving the overall quality of e-wallet services and strengthening the company's position in the market [21]. Therefore, e-wallet companies should pay enough attention to compensation and ensure that they have fair and transparent policies to handle consumer needs.

4. Conclusions

From the study results, it can be concluded that the overall user perception of e-wallets based on e-servqual has significant differences between conditions before and after covid (pair 1). When we examine e-servqual based on its dimensions, the dimensions that have a significant difference between conditions before and after the covid period are system availability and compensation. However, other dimensions such as fulfillment, efficiency, and security and privacy do not have significant differences. It is worth noting that this study has limitations in terms of the population and sample size, which were not extensive and diverse. Therefore, the study's results may have differed if the sample was more diverse. Future research could examine external factors that affect the perceptions of e-wallet users, such as social, psychological, and environmental factors.

Declaration statement

Nuraida Wahyuni: **Conceptualization, Methodology, Supervision, Project administration**. Zahran Fauzan: **Data curation, Validation**. Akbar Gunawan: **Resources, Validation, Formal analysis**. Shanti Kirana Anggraeni: **Resources, Visualization, Investigation**. Evi Febianti: **Data curation, Validation**. Ratna Wkawati: **Writing - Review & Editing**.

Acknowledgement

The authors wish to thank anonymous referees for their constructive feedback.

Disclosure statement

The authors report there are no competing interests to declare.

Funding statement

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Data availability statement

The data that support the findings of this study are available from the corresponding author, [NW], upon reasonable request.

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