The Influence of E-service Quality Dimensions on E-loyalty with E-satisfaction as an Intervening Variable (Study of E-commerce Users in Bandung City)

ABSTRACT

This study aims to examine the influence of e-service quality dimensions on e-loyalty, mediated by e-satisfaction in the Tokopedia application in Bandung. The population in the study consists of Tokopedia application usersgeneration Z who were born in 1995-2010 who are at least 17 years old and reside in Bandung. The sample size for this research is 180 respondents, selected using convenience sampling. The data type utilized in this study is primary data collected through a survey strategy using online questionnaires, with a cross-sectional time horizon. The research utilises analytical techniques like validity and reliability assessments for instruments, tests for classical assumptions, hypothesis testing by multiple linear regression, and the Sobel test utilising an online Sobel calculator. The study is backed by the statistical Software Programme Social Science (SPSS) version 26. Among the thirteen research hypotheses that were put out, empirical data supports 10 of them. The results suggest that e-satisfaction can operate as a mediator between the impact of e-service quality aspects (efficiency, fulfilment, system availability, and privacy) on e-loyalty. Furthermore, the results of this research are beneficial for evaluated management and similar e-commerce industries in designing relevant strategies to enhance the quality of these attributes.

Keywords: [E-service quality; e-satisfaction; e-loyalty; e-commerce.}

1. INTRODUCTION

Internet users in the world have reached 5.16 billion and are projected to continue to increase until the end of the year 2023[1]. Meanwhile, the number of internet users in Indonesia has reached 213 million users as of January 2023 [2]. The availability of internet access can provide opportunities for business people to improve their product or service marketing strategies more broadly, so adjustments need to be made from business actors in business activities, one of which is through e-commerce[3]. Based on data, there are around 178.94 million people in Indonesia who use e-commerce in 2022. This number has increased by 12.79% from the previous year which reached 158.65 million users. Looking at the trend, e-commerce users in Indonesia are observed to continue to increase, the number is projected to reach 196.47 million users by the end of 2023[4]. One of the largest e-commerce in Indonesia is Tokopedia which has a very large number of users [5].Based ondata, during the period from the third quarter of 2019 to the second quarter of 2022, the number of Tokopedia visitors grew by around 140%. In the third quarter of 2022, Tokopedia also managed to achieve a profit increase of 38.94% throughout the 9 months of that year[7]. However, in the fourth quarter of 2022, Tokopedia experienced a decline in visits so that it was ranked second in terms of visits after Shopee with a difference of up to 46 million visitors every month [6].In 2023, the decline in Tokopedia visitors will continue from the first quarter to the third quarter. The following is data on e-commerce visits in Indonesia [7]:

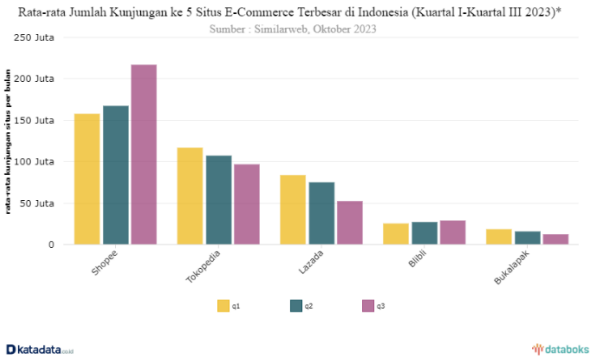

Fig. 1. E-commerce visitors in Indonesia
Source: Kata data, 2023

Based on figure 1. There has been a decline in the volume of visits to Tokopedia, as evidenced by a reduction in consumer e-loyalty. In the first quarter of 2023 Tokopedia achieved an average of 117 million visits, then in the second quarter of 2023 Tokopedia experienced a decrease in visits by 8.4% or to 107.2 million visits, a decline also occurred in the third quarter of 2023 by 9% to 97.1 million visit[7]. Apart from that, in the last 2 years, Tokopedia has experienced a decline in index, where in 2021 it had an index of 16.70%, then decreased by 1.8% in 2022 to 14.90%. The trend of decreasing this index also continue in 2023 with a further decline. This is large, namely 3.6%, this results in Tokopedia only having an index of 11.30%, far behind its competitors which have an index of 45.80% in 2023[8]. This phenomenon could indicate a decline in Tokopedia users' e-loyalty as a problem in this research. Customer loyalty is very important for companies in their efforts to gain customer loyalty[9]. One of the things that drives customer loyalty is customer satisfaction. The higher the customer satisfaction, the higher the loyalty they have[10]. Customer loyalty and satisfaction can be obtained through e-service quality or the quality of service provided by companies providing products or services [10]. As the service improves in quality, customers are likely to develop loyalty and experience satisfaction. A large body of research suggests that in the e-commerce domain, e-loyalty is positively correlated with e-satisfaction[3, 11, 12].That is why e-loyalty is directly proportional to how satisfied an online customer is. Furthermore, research shows that e-satisfaction is positively correlated with e-service quality [3, 12, 13]. As a result, e-satisfaction rises as e-service quality improves. On the flip side, e-loyalty and e-satisfaction are connected through e-satisfaction [3, 11, 14]. This research utilises the following e-service quality dimensions: efficiency, fulfilment, system availability, and privacy. It also makes reference to prior research conducted by [14]. With a generation-Z sample born in 1995-2010 [15]. In this research, the sample used was Tokopedia users who already had an identity card and were at least 17 years old, as well as Bandung City as the research locus because Bandung City was recorded as the area with the highest level of online sales [16].

2. LITERATURE REVIEW

2.1 E-service Quality

Electronic service quality is an important factor in online business, this denotes the capability of an application to efficiently and effectively offer shopping services, handle purchase transactions, and manage distribution through the internet network [17]. E-service quality encompasses every phase of consumers' engagement with a website or application. Alternatively, it can be described as the degree of effectiveness in the online shopping and

shipping process that a website must achieve to meet consumer expectations [18]. More specifically, [19] E-service quality refers to the evaluated outcome of different components, including information retrieval, website browsing, order placing, customer service interactions, order fulfillment, and overall satisfaction with the products during the full transaction process. The general method that is often used in assessing e-service quality is the method developed by [18] because it is considered more flexible than other methods so it is more suitable for use in various aspects. Which is divided into two groups:

1. E-S-QUAL refers to the quality of service provided by an E-core. The scale consists of the following components: efficiency (the ease and speed of accessing and using the site); fulfilment (the degree to which the site fulfils its commitments regarding order delivery and item availability); system availability (the precise technical functioning of the site); privacy (the level of security and safeguarding of customer information provided by the site).
2. E-recovery service quality (E-RecSQUAL) which includes: responsiveness (Efficient management of issues and product returns facilitated via the website.); Compensation refers to the degree to which the website offers financial or other forms of reimbursement to clients for any problems they encounter. Contact refers to the ease of accessing support services either by telephone or online agents.

The evaluation of the service quality of the Tokopedia application in this study was conducted using the E-S-QUAL measurement criteria.

2.2 E-satisfaction

E-satisfaction is the feeling of pleasure felt by customers regarding the online experience when transacting via an e-commerce platform [20]. According to [21] satisfaction is obtained from the results of consumers' assessments of the products or services they have purchased, as this fulfillment can provide positive or negative assessments. Satisfaction is an individual's experience of pleasure or dissatisfaction derived from evaluating the performance or perceived outcome of a product or service in relation to expectations [22].

2.3 E-loyalty

E-loyalty is characterized as a customer's inclination to consistently use a particular online platform, as individuals prefer to conduct their shopping activities on that platform rather than transitioning to others [23]. Loyalty involves a profound commitment from customers to consistently re-engage with and repurchase selected products or services in the future, despite potential influences from changing situations and marketing efforts [24]. [25] suggests that fostering customer loyalty requires a company to emphasize the value of its offerings and demonstrate genuine interest in fulfilling customer desires or cultivating relationships. Moreover, as per [22], customer loyalty is the customer's dedication to a product or service, leading to repeated purchases in subsequent transactions. The indicators employed in this research encompass loyalty towards service purchases, endorsing services, and intending to repurchase services. Additionally, the proposed indicators in this study include the inclination to repurchase in the future, the inclination to recommend the service, and the inclination to remain loyal without switching.

2.4 Theoretical Frameworks and Hypotheses

According [14], The elements of e-service quality, including efficiency, fulfilment, system availability, and privacy, have a favourable impact on e-satisfaction. This remark is corroborated by[26] who discovered that e-satisfaction is positively affected by privacy, system availability, efficiency, and fulfilment. The findings of this study establish that e-satisfaction in the e-commerce sector is positively correlated with the following aspects of e-

service quality: efficiency, fulfilment, system availability, and privacy. Theoretically, e-satisfaction is positively impacted by privacy, efficiency, fulfilment, and system availability. The following hypothesis is based on this explanation:

H1a: Efficiency has a positive effect on e-satisfaction
H1b: Fulfillment has a positive effect on e-satisfaction
H1c: System availability has a positive effect on e-satisfaction
H1d: Privacy has a positive effect on e-satisfaction

According to [14], The characteristics of e-service quality, including efficiency, fulfilment, system availability, and privacy, have a favourable impact on e-loyalty. This assertion is substantiated by empirical study conducted by [27].This indicates that efficiency, fulfilment, system availability, and privacy have a beneficial impact on e-loyalty. The research findings indicate a positive correlation between the aspects of e-service quality (efficiency, fulfilment, system availability, and privacy) and e-loyalty in the e-commerce business. Tokopedia operates within the e-commerce sector. Hence, it is believed that efficiency, satisfaction, system uptime, and confidentiality have a favourable impact on e-loyalty. This explanation serves as the basis for establishing the subsequent hypothesis:

H2a: Efficiency has a positive effect on e-loyalty
H2b: Fulfillment has a positive effect on e-loyalty
H2c: System availability has a positive effect on e-loyalty
H2d: Privacy has a positive effect on e-loyalty

Research conducted by [14] found that e-loyalty is positively influenced by e-satisfaction. This statement is supported by research by [3, 11]. Asserted the existence of a direct correlation between e-satisfaction and e-loyalty. According to the findings of this study, there is a positive correlation between e-satisfaction and e-loyalty in the e-commerce sector. In other words, as e-satisfaction increases, so does e-loyalty. Tokopedia operates within the e-commerce sector. Therefore, it is believed that e-satisfaction has a beneficial impact on e-loyalty. This explanation is the basis for establishing the subsequent hypothesis:

H3: E-satisfaction has a positive effect on e-loyalty

Based on research [14] it was discovered that the many aspects of e-service quality, including efficiency, fulfilment, system availability, and privacy, had a beneficial impact on e-loyalty. This influence is facilitated by e-satisfaction. This remark is corroborated by [28]. The individual who proposed that efficiency, fulfilment, system availability, and privacy exert a favourable impact on e-loyalty through e-satisfaction in the e-commerce sector. This statement implies that the characteristics of e-service quality, such as efficiency, fulfilment, system availability, and privacy, have a favourable impact on e-loyalty in the e-commerce business. This impact is mediated by e-satisfaction. Tokopedia operates within the e-commerce sector. The beneficial impact of e-service quality aspects, such as efficiency, fulfilment, system availability, and privacy, on e-loyalty may be inferred, with e-satisfaction acting as a mediator. This explanation serves as the basis for formulating the following hypothesis:

H4a: E-satisfaction plays a mediating role in the influence of efficiency on e-loyalty
H4b: E-satisfaction plays a mediating role in the effect of fulfillment on e-loyalty
H4c: E-satisfaction plays a mediating role in the influence of system availability on e-loyalty
H4d: E-satisfaction plays a mediating role in the influence of privacy on e-loyalty

The interrelationships among the variables outlined in the aforementioned framework are illustrated in the conceptual model presented in the image.

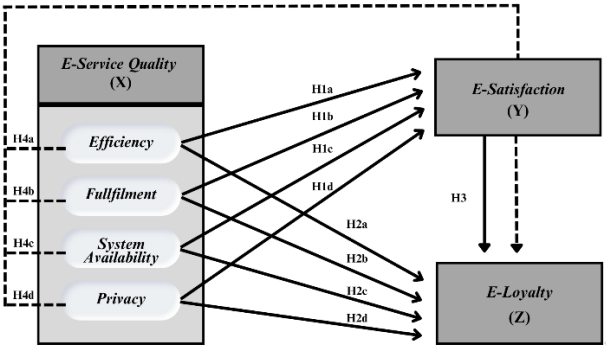

Fig. 2 Conceptual Framework

The conceptual model of the relationship between e-service quality dimensions (efficiency, fulfilment, system availability, privacy) on e-loyalty with e-satisfaction as an intervening variable (study of e-commerce users in Bandung City) as seen in Figure 2.

3. METHODOLOGY

3.1 Research Objectives, Approaches, and Strategies

This research utilises deductive reasoning to evaluate positive directed hypotheses, specifically causal investigations, in order to support the theory upon which these hypotheses are based. The study employs a quantitative technique, utilising a survey as the primary research tool. The process of operationalizing variables and assessing the four variables in this study was carried out utilising the Likert scale. Participants expressed their degree of agreement or disagreement with items using a five-point Likert scale, providing values ranging from 1 to 5. A questionnaire was used to gather primary data. Validity assessment of each statement on the questionnaire was conducted using the Product Moment correlation approach, while reliability was evaluated using the Cronbach's Alpha coefficient measurement technique. The research used convenience sampling as the sample strategy, which is a nonprobability type of sampling. The sample size for this study was determined to be 180 individuals, which may be considered suitable since it surpasses the minimal sample size recommended by the rule of thumb proposed by [29] and supported by [30]. The need for multivariate research, such as multiple regression, is to have a minimum sample size that is at least 10 times the number of study variables. In this study, researchers established the sample size to be 30 times the number of variables, which include the dimensions of e-service quality (efficiency, fulfilment, system availability, and privacy), e-satisfaction, and e-loyalty.

3.2 Characteristics of the Research Population

This research involve samples from the population, especially generation Z who were born in 1995-2010 [15] and already have an identity card with a minimum age of 17 years, the age

requirement is determined based on the assumption that they have sufficient cognitive capacity to be able to fill out the statement contained in the questionnaire and have shopped on the Tokopedia application at least 3 times in the last 3 months. The city of Bandung was chosen as the research locus because the city of Bandung is the capital of West Java and according to census data, 51 percent of them are dominated by the millennial generation and generation Z [31]. Apart from that, the city of Bandung is also recorded as the area with the highest level of online sales [16].

3.3 Data Processing and Analysis Methods

This study use data verification, coding, and table building as the techniques for processing the data. Simultaneously, a quantitative data analysis approach is employed, utilising the Statistics Programme of Social Science (SPSS) software version 26 for doing multiple regression. In addition, the Sobel test is used to examine the mediating effect of E-satisfaction on the relationship between independent factors (Efficiency, fulfilment, system availability, and privacy) and dependent factors (E-loyalty).

4. RESULTS AND DISCUSSION

4.1 Respondent Profile

According to the data presented in Table 1, the participants in this study are individuals acting as consumers. Generation Z who were born in 1995-2010 [15] and already have an identity card with a minimum age of 17 years also have shopped on the Tokopedia application at least 3 times in the last 3 months and lived in city of Bandung.

Table 1. Respondent Profile

No	Information	Sum	(%)
Gender			
1	Man	72	40%
2	Woman	108	60%
	Total	**180**	**100%**
Age			
1	17 n/d 22	101	56%
2	23 n/d 28	79	44%
	Total	**180**	**100%**
Location			
1	Bandung City	180	100%
	Total	**180**	**100%**
Occupation			
1	Students	60	33%
2	Working part-time	48	27%
3	Working full-time	72	40%
	Total	**180**	**100%**
Income			
1	< Rp 1.500.000	26	14%
2	Rp 1.500.000 - Rp 5.000.000	116	64%
3	> Rp 5.000.000	38	22%
	Total	**180**	**100%**
Get to know the Tokopedia application			
1	Yes	180	100%

2	No	0	0%
	Total	**180**	**100%**
Have shopped on the Tokopedia application at least 3 times in the last 3 months			
1	Yes	180	100%
2	No	0	0%
	Total	**180**	**100%**

Source: Researcher-Processed Information (2023)

4.2 Validity and Reliability Test

This study examines six variables, namely efficiency (X1), fulfillment (X2), system availability (X3), privacy (X4), e-satisfaction (Y), and e-loyalty (Z). Each of these variables comprises several indicators with measurements specified in the questionnaire statements. Prior to evaluating the findings, it is essential to conduct a validity and reliability test for the measurements of these six variables. Using SPSS Software version 26, the calculation for the validity and reliability tests yielded the following results.

Table 2. Validity and Reliability test

No	Statement	R.calculate	Note	Cronbach's alpha	Note
Efficiency (X1)					
1.	The Tokopedia application makes it easy for me to find the product I want.	0.841	Valid		
2.	I can easily find product information that I want in the Tokopedia application.	0.817	Valid	0.723	Reliable
3.	I can easily make transactions via the Tokopedia application.	0.746	Valid		
Fulfillment					
1.	Delivery of products via the Tokopedia application on time.	0.855	Valid		
2.	I got the product according to what was offered on the Tokopedia application.	0.866	Valid	0.649	Reliable
System Availability					
1.	The Tokopedia application system is always available all	0.930	Valid	0.839	Reliable

	the time.				
2.	The speed of the Tokopedia application system runs smoothly when used.	0.927	Valid		
Privacy					
1.	The Tokopedia application is able to protect my personal information.	0.902	Valid		
2.	The Tokopedia application is able to protect my personal information from fraud/third parties.	0.936	Valid	0.901	Reliable
3.	The Tokopedia application is able to describe the privacy policy clearly.	0.906	Valid		
E-satisfaction					
1.	I feel happy after shopping on the Tokopedia application.	0.733	Valid		
2.	My hopes are fulfilled by shopping on the Tokopedia application.	0.862	Valid	0.745	Reliable
3.	I feel shopping through the Tokopedia application is the right decision.	0.848	Valid		
E-loyalty					
1.	I want to make a repeat purchase via the Tokopedia application.	0.738	Valid		
2.	I would recommend the Tokopedia application to others as a place to shop online.	0.748	Valid	0.818	Reliable
3.	I want to make the Tokopedia application the main choice for online shopping.	0.839	Valid		
4.	I would like to revisit the Tokopedia App in the future.	0.885	Valid		

Source: Researcher-Processed Information (2023)

4.3 Classical Assumptions Test

This study will be subjected to testing employing two (2) variable techniques, particularly designed for the investigation of intervening factors. Consequently, the classical assumption test will be undertaken using these two (2) methodologies.

4.3.1 Test the classical assumption of intervening variables

4.3.1.1 Equation 1

Equation 1 employs a multiple regression equation to examine the significant influence of efficiency, fulfillment, system availability, and privacy on e-satisfaction. The multiple regression equation is as follows:

$$Y = a_1 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Note:

Y = E-satisfaction
a = Constant
b = Coefficient of Increase of Bound Variables If there is An Increase of One Unit of Free Variables
X1 = Efficiency
X2 = Fulfillment
X3 = System Availability
X4 = Privacy

The findings of the classical assumption test, which includes tests for normality, multicollinearity, and heteroskedasticityapplied to multiple regression analysis as follows:

4.3.1.1.1 Normality test

With a significant value >(0.05), specifically a significance value of (0.326), it can be concluded from the analysis results presented in the table above that the data in equation 1 follows a normal distribution.

Table 3. Normality test equation 1

N		**180**
Normal Parameters[a,b]	**Mean**	**.00**
	Std. Deviation	.895
Most Extreme Differences	Absolute	.070
	Positive	.070
	Negative	-.056
Test Statistic		.070
Asymp. Sig. (2-tailed)		.032[c]
Exact Sig. (2-tailed)		.326
Point Probability		.000

a. Test distribution is Normal, b. Calculated from data, c. Lilliefors Significance Correction.
Source: SPSS Output Data Version 26 (2023)

4.3.1.1.2 Heteroskedasticity test

The examination of the table indicates that there are no signs of heteroskedasticity in the data of equation 1, since the significant value >(0.05).

Table 4. Heteroskedasticity test equation 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.447	.231		1.935	.055
	Efficiency	-.021	.032	-.083	-.641	.522
	Fulfillment	.084	.044	.213	1.905	.058
	System Availability	.010	.035	.032	.296	.767
	Privacy	-.026	.035	-.090	-.732	.465

a. Dependent Variable: Abs_RES1
Source: SPSS Output Data Version 26 (2023)

4.3.1.1.3 Multicholenierity test

The results from the table analysis indicate that the data in equation 1 is devoid of multicollinearity, given that the tolerance values for the variables are >(0.1) and the VIF value is <(10).

Table 5. Multicholenierity test equation 1

Variable	Collinearity Statistics	
	Tolerance Value	VIF
Efficiency	.545	1.836
Fulfillment	.648	1.544
System Availability	.363	2.752
Privacy	.317	3.152

a. Dependent Variable: E-satisfaction
Source: SPSS Output Data Version 26 (2023)

4.3.1.2 Equation 2

The hypothesis aims to assess the substantial correlation between efficiency, fulfillment, system availability, privacy, and e-satisfaction with e-loyalty. The multiple regression equation as follows:

$$Z = a_2 + b_5X_1 + b_6X_2 + b_7X_3 + b_8X_4 + b_9Y$$

Note:

Z = E-loyalty
Y = E-satisfaction
a = Constant

b = Coefficient of Increase of Bound Variables If there is An Increase of One Unit of Free Variables
X1 = Efficiency
X2 = Fulfillment
X3 = System Availability
X4 = Privacy

The classical assumption test conducted on the multiple regression analysis includes assessments for normality, heteroskedasticity, and multicollinearity. The study's findings regarding the classical assumption test are as follows:

4.3.1.2.1 Normality test

The results of the study can be seen in the table above; a significance value of (0.200)>(0.05), indicating that the data in equation 2 follows a normal distribution.

Table 6. Normality test equation 2

N		**180**
Normal Parameters[a,b]	**Mean**	**.00**
	Std. Deviation	1.481
Most Extreme Differences	Absolute	.048
	Positive	.048
	Negative	-.021
Test Statistic		.048
Asymp. Sig. (2-tailed)		.200[c.d]
Exact Sig. (2-tailed)		.788
Point Probability		.000

a. Test distribution is Normal, b. Calculated from data.
c. Lilliefors Significance Correction, d. This is a lower bound of the true significance
Source: SPSS Output Data Version 26 (2023)

4.3.1.2.2 Heteroskedasticity test

The analysis results from the table lead to the conclusion that, in the data of equation 2, there are no indications of heteroskedasticity, as evidenced by the significant value being >(0.05).

Table 7. Heteroskedasticity test equation 2

Coefficients[a]

Model		**Unstandardized Coefficients**		**Standardized Coefficients**		
		B	**Std. Error**	**Beta**	**T**	**Sig.**
1	(Constant)	1.008	.379		2.659	.009
	Efficiency	.076	.072	.193	1.048	.296
	Fulfillment	.090	.071	.144	1.268	.206
	System Availability	-.031	.055	-.062	-.560	.577
	Privacy	-.050	.058	-.113	-.861	.391
	E-Satisfaction	-.047	.076	-.121	-.622	.535

a. Dependent Variable: Abs_RES2
Source: SPSS Output Data Version 26 (2023)

4.3.1.2.3 Multicholenierity test

According to the results from the table analysis, it can be asserted that the data in equation 2 is devoid of multicollinearity, as indicated by tolerance values for the variables being >(0.1) and the VIF value being <(10).

Table 8. Multicholenierity test equation 2

Variable	Collinearity Statistics	
	Tolerance Value	VIF
Efficiency	.530	1.887
Fulfillment	.588	1.702
System Availability	.325	3.079
Privacy	.279	3.582
E-satisfaction	.296	3.374

a. Dependent Variable: E-loyalty
Source: SPSS Output Data Version 26 (2023)

4.3.3 Results of multiple regression analysis with intervening variables

4.3.3.1 Multiple regression analysis equation 1's

Drawing conclusions from the analysis results displayed in the table, it can be inferred that the e-satisfaction (Y) is significantly influenced by the efficiency (X1), fulfillment (X2), system availability (X3), and privacy (X4) variables, given that its significance value is < 0.05. As a result, H1a n/d H1d is accepted. The result of this study align with the research conducted [14, 26]. Which states that efficiency, fulfillment, system availability, and privacy has a significant effect on e-satisfaction in e-commerce.

Table 9. Multiple regression test results equation 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	1.015	.690		1.471	.143
	Efficiency	.116	.052	.124	2.216	.028
	Fulfillment	.316	.075	.216	4.228	.000
	System Availability	.462	.101	.311	4.556	.000
	Privacy	.285	.058	.357	4.887	.000

a. Dependent Variable: E-satisfaction
Source: SPSS Output Data Version 26 (2023)

4.3.3.2 Multiple regression analysis equation 2's

From the results of the analysis depicted in the table, it can be concluded that the e-loyalty (Z) is significantly influenced by the system availability (X3) and e-satisfaction (Y) variable,

as indicated by its significance value being <(0.05). Consequently, H2c and H3 are accepted. The findings of this study align with those of the conducted research [14, 27] which states that system availability has a significant effect on e-loyalty in e-commerce and the research conducted [3, 11] the hypothesis asserting that e-satisfaction significantly influences e-loyalty in e-commerce is supported. However, H2a, H2b, and H2d are dismissed, as evidenced by the analysis results in the table, where the significance values for efficiency (X1), fulfillment (X2), and privacy (X4) are >(0.05), which indicates that the variable has no significant impact on the e-loyalty (Z) variable. This study deviates from the outcomes of the conducted research by [32].

Table 10. Multiple regression test results equation 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.255	.957		.267	.790
	Efficiency	.140	.073	.106	1.920	.057
	Fulfillment	.026	.108	.013	.242	.809
	System Availability	.303	.148	.145	2.050	.042
	Privacy	.087	.086	.077	1.017	.310
	E-satisfaction	.837	.104	.593	8.035	.000

a. Dependent Variable: E-loyalty

Source: SPSS Output Data Version 26 (2023)

4.3.3.3 Sobel test

Based on the test findings H4a n/d H4d show success in rejecting H0. As indicated by the analysis conducted using the Sobel calculator, where the significance value is <(0.05). So, e-satisfaction plays a role in mediating the influence of efficiency, fulfillment, system availability and privacy on e-loyalty. This finding is supported by the research results of [14, 28] that e-satisfaction plays a role in mediating the influence of efficiency, fulfillment, system availability, and privacy on e-loyalty. Based on the explanation that has been presented, the results of this research strengthen previous research in a similar context, namely e-commerce.

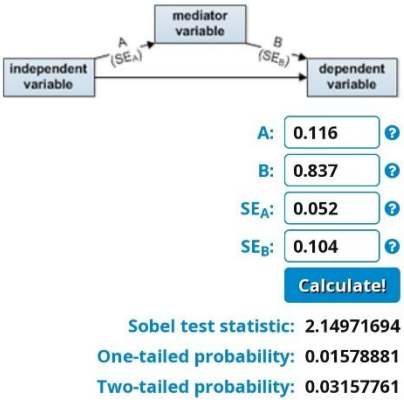

Fig. 3. Result of sobel test calculator efficiency

Source: Output sobel test calculator (2023)

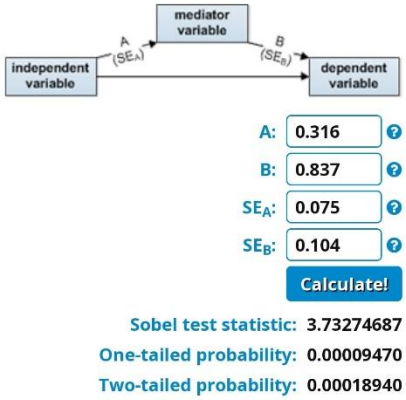

Fig. 4. Result of sobel test calculator fulfillment

Source: Output sobel test calculator (2023)

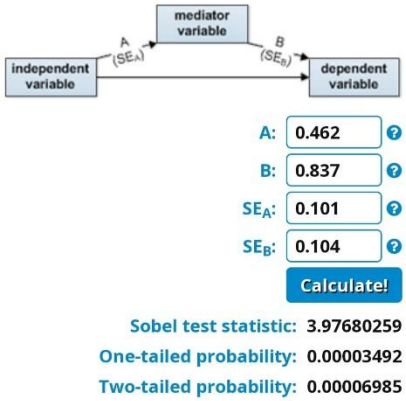

Fig. 5. Result of sobel test calculator system availability

Source: Output sobel test calculator (2023)

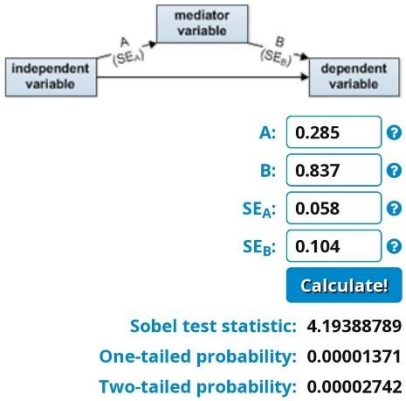

Fig. 6. Result of sobel test calculator privacy

Source: Output sobel test calculator (2023)

5. CONCLUSION

The 13 (thirteen) hypotheses of the study are categorized into 10 (ten) that are accepted and 3 that are rejected. This division illustrates that the research hypotheses, grounded in relevant theory, receive complete empirical support. Additionally, the results underscore the endorsement of prior research regarding the examination of influences among variables. The outcomes of this inquiry can be summarized as follows:

1. Efficiency has a positive and significant effect on e-satisfaction among Tokopedia application users in Bandung City supported by research [14, 26].
2. Fulfillment has a positive and significant effect on e-satisfaction among Tokopedia application users in Bandung City supported by research [14, 26].
3. System availability has a positive and significant effect on e-satisfaction among Tokopedia application users in Bandung City supported by research [14, 26].
4. Privacy has a positive and significant effect on e-satisfaction among Tokopedia application users in Bandung City supported by research [14, 26].
5. Efficiency has no significant effect on e-loyalty among Tokopedia application users in Bandung City supported by research [32].
6. Fulfillment has no significant effect on e-loyalty among Tokopedia application users in Bandung City supported by research [32].
7. System availability has a positive and significant effect on e-loyalty among Tokopedia application users in Bandung City supported by research [14, 27].
8. Privacy has no significant effect on e-loyalty among Tokopedia application users in Bandung City supported by research [32].
9. E-satisfaction has a positive and significant effect on e-loyalty among Tokopedia application users in Bandung City supported by research [3, 11].
10. Efficiency has a positive and significant effect on e-loyalty mediated by e-satisfaction among Tokopedia application users in Bandung City supported by research[14, 28].
11. Fulfillment has a positive and significant effect on e-loyalty mediated by e-satisfaction among Tokopedia application users in Bandung City supported by research[14, 28].
12. System availability has a positive and significant effect on e-loyalty mediated by e-satisfaction among Tokopedia application users in Bandung City supported by research[14, 28].
13. Privacy has a positive and significant effect on e-loyalty mediated by e-satisfaction among Tokopedia application users in Bandung City supported by research[14, 28].

6. SUGGESTION

Referring to the findings of this research, several suggestions are presented that can provide benefits for Tokopedia application companies in Bandung City, the following is the explanation:

6.1 Scientific Implications

This study has certain limitations, particularly concerning its scope, group size, characteristics, and analytical methods. To enhance the representation of the population, future research could broaden the demographic scope to include a more diverse range of e-commerce users for generalizability.The sample for this study comprised 180 respondents, and future studies could benefit from larger samples to yield more robust results. The research specifically targeted Generation Z members, born between 1995 and 2010, with a minimum age of 17 years, based on identity card criteria. To enhance the study's generalizability, it is recommended that future research includes participants from a wider age range to capture a more diverse population and obtain more comprehensive data.

Additionally, future research exploring additional dimensions could provide a more comprehensive understanding of factors influencing e-loyaltyand investigate additional intervening variables that influence e-loyalty in the e-commerce sector. In order to find correlations between the variables that were analysed, researchers need use advanced analytical approaches like path analysis, structural equation model (SEM), or Partial Least Square (PLS) for additional data analysis. A more thorough comprehension of the relationships within the research framework could be achieved by utilising additional methods for data analysis, in addition to multiple regression and the Sobel test, which were used in this study.

6.2 Managerial Implications

The study does not provide a comprehensive description of Tokopedia app users. On the other hand, consumer happiness mediates the relationship between e-service quality and customer loyalty, and the Tokopedia app can get a bird's-eye view of these dimensions. Therefore, suggestions that can be given to the Tokopedia Application in order to increase customer loyalty include that Tokopedia needs to carry out further research regarding increasing efficiency in their operational processes, especially in terms of searching for information, browsing websites and placing orders. Management needs to continue to ensure adequate goods availability and reliable delivery times to meet consumer expectations. Tokopedia also needs to pay attention to efforts to improve data security and provide transparent information regarding privacy policies to build user trust. By combining these steps, Tokopedia can create a more satisfying online shopping environment, build strong relationships with customers, and in turn, increase customer loyalty levels.Utilizing real-time customer data allows for the instant customization of user experiences. Practitioners can leverage advanced algorithms and machine learning models to analyze large datasets in real-time, identifying patterns that highlight each customer's unique interests and needs and practitioners can implement personalized recommendations, targeted promotions, and real-time feedback mechanisms, fostering stronger customer engagement and loyalty.

REFERENCES

1. Cindy Mutia. Number of Global Internet Users Will Rreach 5.16 Billion People in January 2023. 2023;03:02. Accessed 18 October 2023. Available: https://databoks.katadata.co.id/datapublish/2023/02/03/jumlah-pengguna-internet-global-tembus-516-miliar-orang-pada-januari-2023

2. Cindy Mutia. Internet Users in Indonesia Reach 213 Million People by Early 2023. 2023;20:09. Accessed 20 October 2023. Available: https://databoks.katadata.co.id/datapublish/2023/09/20/pengguna-internet-di-indonesia-tembus-213-juta-orang-hingga-awal-2023

3. IkePuspitayanti, Sunarno, &Mochamad Edris. The influence of e-recovery service quality and e-service quality on loyalty through Tokopedia customer satisfaction. Journal of Finance and Business Digital. 2023;2(3):243-256. DOI: https://doi.org/10.55927/jfbd.v2i3.5958

4. Ridwan Mustajab. RI E-Commerce Users Projected to Reach 196.47 Million in 2023. 2023;4:9. Accessed 20 October 2023. Available: https://dataindonesia.id/ekonomi-digital/detail/pengguna-ecommerce-ri-diproyeksi-capai-19647-juta-pada-2023

5. Ristanti, K. A., & Sri VandayuliRiorini. The influence of e-service quality on e-satisfaction and its impact on online transportation consumers' e-wom. TrisaktiEconomic Journal. 2023;3(1):1447–1456. DOI: https://doi.org/10.25105/jet.v3i1.16211

6. Jaja Suteja. Shopee, Tokopedia, and Lazada, Who is the Champion?.2023;20:01. Accessed 10 October 2023. Available: https://investor.id/business/319585/shopee-tokopedia-dan-lazada-sai-juara

7. Adi Hidayat. Trends in E-Commerce Visitors in the Third Quarter of 2023, Shopee is Increasingly Expanding. 2023;11:10. Accessed 1 November 2023. Available: https://databoks.katadata.co.id/datapublish/2023/10/11/tren-pengunjung-e-commerce-kuartal-iii-2023-shopee-kian-melesat

8. Top brand award. Comparison of brand index of online buying and selling sites. 2023. Accessed 20 October 2023. Available: https://www.topbrand-award.com/komparasi_brand/bandingkan?id_award=1&id_kategori=6&id_subkategori=540

9. Ramanta, T. H., Massie, J. D. D., Soepeno, D., Tri, O. Analysis of factors affecting customer loyalty furniture products at CV. KaruniaMebel Tuminting. Journal of Economics, Management, Business, Accounting. 2023;9(1):1018-1027. ISSN 2303-1174. Available: https://ejournal.unsrat.ac.id/v2/index.php/emba/article/view/32670/30895

10. DwiUluvianti, L., Made Bayu Dirgantara, I., &Quirira Octavio, D. Analysis of factors that influence consumer satisfaction and loyalty in several e-commerce. Diponegoro Journal of Management. 2022;11(6). ISSN: 2337-3792

11. Alfarobi, M. L., & Widodo, T. The effect of e-trust, e-service quality on e-loyalty through e-satisfaction as intervening variables on Tokopedia application users in Bandung City. E-Proceedings of Management. 2023;10(2):840. ISSN: 2355-9357

12. Hidayah&Suryadi, N. The influence of e-service quality on e-loyalty through e-satisfaction among Tokopedia e-commerce users. Brawijaya University FEB Student Scientific Journal. 2023;9(2). Available: https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/7327

13. Tri, R., Yanto-Anisah, Y., &Anjarsari, D. The influence of e-service quality on e-Commerce customer satisfaction (Case study of Shopee online store users). Journal of Business and Marketing. 2021;11(1). ISSN: 2087-3077

14. Sheu, P. L., & Chang, S. C. Relationship of service quality dimensions, customer satisfaction and loyalty in e-commerce: a case study of the shopee app. Applied Economics. 2022;54(40):4597-4607. DOI:https://doi.org/10.1080/00036846.2021.1980198

15. Aeni, S. N. This is the difference between Generations X, Y, Z and the other two generations.2022;11:03. Accessed 1 November 2023.Available: https://katadata.co.id/sitinuraeni/berita/622a9b4b4099f/inilah-perbedaangenerasi-x-y-z-dengan-dua-generasi-lainnya

16. LaluRahadian. These Three Cities Experience an Increase in Online Shopping Trends.2022;15:01. Accessed10 October 2023.Available: https://www.cnbcindonesia.com/tech/20220117110524-37-307870/tiga-kota-ini-alami-peningkatan-tren-belanja-daring

17. SaskiaFirdha A., & Novi Marlena. The influence of e-service quality and e-trust on consumer satisfaction.FEB UNMUL Journal. 2021;23(3):463-474. ISSN: 1411-1713

18. Parasuraman, A., Zeithaml, V. A., & Malhotra, A. E-S-QUAL a multiple-item scale for assessing electronic service quality. Journal of Service Research. 2005;7(3):213-233. DOI: https://doi.org/10.1177/1094670504271156

19. Wolfinbarger, M. and Gilly, M.C. eTailQ: Dimensionalizing, Measuring and Predicting Etail Quality. Journal of Retailing. 2003;79(3):183-198 DOI: https://doi.org/10.1016/S0022-4359(03)00034-4

20. AnnisaRiyadi, S., Suhud, U., & Usman, O.The influence of e-service quality and brand image on e-satisfaction and e-loyalty among Tiktok shop users. Journal of Business, Management, and Finance. 2023;4(1)

21. Irawan, H. 10 Principles of Customer Satisfaction. Jakarta: Elex Media Komputindo; 2009.

22. Keller, Kevin Lane, Kotler, Philip. Marketing management. 15th ed. Global edition Boston: Pearson, 2016.

23. Anderson, R. E., & Srinivasan, S. S.E-satisfaction and e-loyalty: a contingency framework. Journal of Psychology and Marketing. 2003;20(2):123-138. DOI: 10.1002/mar.10063

24. Oliver, R.L. Whence Consumer Loyalty. Journal of Marketing. 1999;63:33-34. DOI https://doi.org/10.2307/1252099

25. Griffin, W, Ricky dan Ronald J Ebert. Management. Erlangga: Jakarta, 2002.

26. Mayasari, M. &Audina. A. The influence of e-service website e-commerce quality to e-customer satisfaction. Proceedings of the First International Conference on Applied Science and Technology. 2020;298. DOI: https://doi.org/10.2991/assehr.k.200813.018

27. Rahardhini, S., Rahmayanti, D., &Oetarjo, M. Effect of E-Service Quality E-Satisfaction and E-Trust on E-Customer Loyalty. (Study on Marketplace Shopee users in Sidoarjo). UMSIDA Preprints Server. 2022. DOI: https://doi.org/10.21070/ups.2973

28. Atha, A., Cahyanti, A., Sudarmiati, Titis, &Dhewi, S. Effect of E-Service Quality and E-Trust on E-Loyalty of E-Payment Through E-Satisfaction of Shopee pay Users. In International Journal of Humanities Education and Social Sciences (IJHESS). 2022;2(1). DOI: https://doi.org/10.55227/ijhess.v2i1.234

29. Roscoe, J.T. Fundamental Research Statistics for the Behavioral Sciences by John T. Roscoe. Holt, Rinehart and Winston, New York, 1975.

30. Sekaran, Uma and Roger Bougie. Research Methods for Business: Skills-Development Approach, Edition 6, Book 2, SalembaEmpat, South Jakarta 12610, 2017.

31. YayanBrilyana. Around 51 Percent of Bandung City's Population, Millennial Generation and Gen Z. 2022;26:04. Accessed 1 November 2023. Available: https://www.bandung.go.id/news/read/6365/sekitar-51-persen-penduduk-kota-bandung-generasi-milenial-dan-gen-z

32. Waruwu, & Sahir. The Influence of E-Service Quality and Brand Image on E-Loyalty among Shopee Application Users. In Journal of Business and Economics Research (JBE). 2022;3(3):335-341. DOI: 10.47065/jbe.v3i3.2298