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The Influence of Neuromarketing And User Interface on Consumer Satisfaction In E-Commerce Transactions (Study of USU Students Using the Shopee Platform in Medan)

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Abstract

E-commerce is a buying and selling activity via the internet network where buyers and sellers do not meet directly, but communicate via the internet. This form of research uses quantitative research with an associative approach. The results in this study show that testing the first hypothesis obtained a significance value for the influence of neuromarketing (X1) on consumer satisfaction (Y) which was 0.000 < 0.05 and the tcount value was 4.344 > ttable 1.985. Testing the second hypothesis shows that the significance value of the influence of the user interface (X2) on consumer satisfaction (Y) is 0.000 < 0.05 and the t value is 10.325 > t table 1.985. The f test shows that the influence value of neuromarketing (X1) and user interface (X2) together or simultaneously on the consumer satisfaction variable is 0.000 < 0.05 and the calculated f value obtained is 172,403 > 3.090. The conclusion of this research is that neuromarketing (X1) and user interface (X2) partially have a positive and significant effect on consumer stasfaction (Y), and the variables neuromarketing (X1) and user interface (X2) simultaneously have a positive and significant effect on consumer satisfaction (Y).

***Keywords*:** *Neuromarketing, user interface, and consumer satisfaction*

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INTRODUCTION

Currently, technological advances are making changes in all aspects of life. One thing that has experienced changes is the trade aspect. Where, before technology developed rapidly, trading was done directly or face to face. Technological innovation can provide significant benefits for companies, such as increased competitiveness, revenue growth, operational efficiency, and better fulfillment of customer needs (Siregar *et al*, 2023). According to Siregar *et al* (2023:88), marketing is a system involving various interconnected activities, such as product planning, pricing, distribution, and promotion. However, nowadays trading can be done online. This can happen due to the massive advances in technology at this time. Online trading is better known as e-commerce. According to Ahmadi in Marcel and Astri (2018) e-commerce is buying and selling activities via the internet network where buyers and sellers do not meet directly, but communicate via internet media. Referring to data reported by Bank Indonesia (2023), Indonesian data reports that the transaction value in e-commerce trade in Indonesia reached IDR 476.63 trillion with a transaction volume of 3.49 billion times.

Apart from that, based on data from Statista Market Insights (2023) reported by Indonesian data, the number of e-commerce users has increased from 2021 where e-commerce users amounted to 158.65 million users, increasing in 2022 to 178.94 million

e-commerce users. -commerce. E-commerce platforms in Indonesia are growing rapidly. However, based on data reported by Media Indonesia on February 3 2023, the e-commerce platform that is top of mind is Shopee, followed by Tokopedia and Lazada. Apart from that, Shopee also managed to record the highest market share in the number of transactions in three months of transactions, namely 41%, followed by Tokopedia (34%) and Lazada (16%). In the first quarter of 2023, Shopee will become the e-commerce platform with the most visitors. In increasingly fierce competition among e-commerce platforms, Shopee has succeeded in maintaining its position as the main choice of Indonesian people for making online purchases.

This success is not only supported by a variety of attractive promotions, but also by an efficient delivery policy. Shopee actively collaborates with various logistics services to optimize shipping costs, thereby providing added value for consumers. In addition, Shopee provides customers with flexibility in choosing logistics services that suit their needs, including the ability to set delivery schedules according to preferences. With the convenience of the payment system through the Shopee application, users can easily complete purchase transactions using their smartphone. Based on cross-generational e-commerce platform users in Indonesia, it is still dominated by the millennial generation and generation Z with a percentage of 85% (Kiki Safitri, Yoga Sukmana. 2020." "These Two Generations Are the Biggest Contributors to E-commerce Transactions in RI." Kompas. 4 August 2020).

It can be interpreted that e-commerce platform users are more dominant at the student level. This is because students still belong to the millennial and Z generations. Based on opinion research (Jakpat) Special Report entitled Indonesia e-commerce in 2021, Shopee users consist of 54% women and 46% men. Judging from the age of Shopee's largest users, 20-24 year olds are 24%, 25-29 year olds are 23%, 30-34 year olds are 19%, 40-44 year olds are 10%, and 15-19 year olds are 7%. . It can be seen from the data above that Shopee's largest users are aged 20-24 years and students are a significant user group in the e-commerce industry, so the researchers chose Universitas Sumatera Utara (USU) students to be used as samples for this research. Despite the rapid growth of e-commerce and increasing usage by students, there are still challenges that need to be overcome in maintaining and increasing consumer satisfaction levels.

Consumer satisfaction is an important factor in the continuity of an e-commerce business, because it can influence repeat purchase decisions, customer loyalty, and the brand image of the e-commerce platform. Therefore, it is important for e-commerce platforms like Shopee to understand the factors that influence the level of consumer satisfaction in online transactions. One area that is growing rapidly and can provide valuable insights in understanding consumer behavior is neuromarketing. Neuromarketing combines research on the human nervous system with marketing principles to understand how consumers respond to visual stimuli, including user interfaces on e-commerce platforms. Based on research conducted by Ismajli, *et al* (2022), neuromarketing is used to identify customer preferences. Neuromarketing helps in selecting advertisements to include the necessary elements to make consumers remember them.

Great care is taken when advertising products and information about promotional discounts greatly influences product choices. Shopee regularly holds daily online shopping campaigns, with peak events held on special dates (twin dates) such as 11.11, 12.12, and so on. In the 2020 "12.12 Birthday Sale" shopping campaign, Shopee is offering promotions in the form of flash sales for Dell Laptops, LG Smart TVs, and

iPhone 11, each priced at 12 thousand rupiah, 100% cashback vouchers worth 1.2 million rupiah, free shipping vouchers 0 rupiah to 120 thousand rupiah, checkout Rp. 100, ShopeePay Deals Rp. 1, and many other interesting promos. This promotion recorded an 8-fold increase in sales from the previous year, selling 1 million products in 1 minute, which is usually only 2.8 million products a day, and the largest transaction in the first hour, namely IDR 60 million in the form of 3 smartphones.

This shows neuromarketing activity in increasing emotional reaction indicators. One of the biggest benefits of neuromarketing is that it provides secure information for marketers by making it easier for them to interact with consumers to meet their needs and desires. The application of neuromarketing in various industries brings new opportunities as well as new challenges (Ferman & Kurtoglu, 2020). For decades, marketers have tried to understand human behavior with traditional measuring tools such as focus groups and interviews to understand what consumers really want. In research conducted by Aliyah (2019), neuromarketing research eliminates subjectivity, by measuring behavior observable brain. This happens because 95% of the buying decision process is carried out in the part of the brain that handles emotions.

The goal of neuromarketing is to find out how the brain is physiologically influenced by advertising and other marketing strategies, using the help of medical tools such as FMRI, EEG, Eye Tracking and so on. The marketing tools that can be used by neuromarketing include: advertising, pricing, new product development, communication, branding and product design. The marketing tool used by Shopee in the form of Paylater in the Shopee application can be used directly when selecting a payment method using the Shopee feature with limits determined by the application. Shopee PayLater is a PayLater credit facility available on Shopee e-commerce. With PayLater, buyers on Shopee can buy in installments without a credit card. The difference between Shopee PayLater and other PayLaters is that PayLater belongs to Shopee, so the application and use process is easier and faster.

The results obtained are implemented into a marketing strategy that is proven to effectively influence application usage behavior. Apart from neuromarketing, the user interface also plays a crucial role in the consumer shopping experience. An easy-to-use user interface, intuitive navigation, and attractive appearance can help consumers feel comfortable in exploring and transacting on e-commerce platforms. On the other hand, a complicated or unresponsive user interface can result in frustration and increase the level of consumer dissatisfaction. Based on research conducted by Samapta (2023), implementing a good User Interface on the Shopee application is one of the factors that can increase consumer satisfaction and purchasing decisions on the Shopee application. Previous research in 2020 entitled "The Impact of the Shopee Application's User Interface on People's Shopping Interest" by A'yuni stated that there was a significant correlation between the User Interface (UI) and people's shopping interest.

This can be seen from the ease of use of the Shopee UI, researchers see the Shopee home page which displays popular products, recommendations and special offers so that users can easily explore different products and categories from here. Based on this background, researchers are interested in examining variables, such as neuromarketing which includes non-invasive methods and the extent to which the user interface influences consumer satisfaction in e-commerce transactions, namely Shopee.

METHOD

This form of research uses quantitative research with an associative approach. According to Sugiyono (2018:15) quantitative data is a research method based on positivistic (concrete data), research data in the form of numbers that will be measured using statistics as a calculation test tool, related to the problem being studied to produce a conclusion.

RESULTS AND DISCUSSION

Data Presentation

General Description of Research Subjects Based on Sample Criteria

The characteristics in this study are described in 3 terms, namely, gender, age, and frequency of purchases at Shopee in the last 1 year.

a. Gender

Table 1 Respondent Identity Based on Gender

No	Gender	Amount	Percentage (%)
1	Male	38	38%
2	Female	62	62%
Total		**100**	**100%**

Source: Data Processing Results (2023)

Based on the data in table 4.2, it is known that the percentage of respondents is 62% female and 38% male. This shows that women dominate when it comes to shopping online.

b. Age

Table 2 Respondent Identity Based on Age

No	Age	Amount	Percentage (%)
1	17 - 19 years	13	13%
2	20 - 21 years	63	63%
3	22 - 23 years	22	22%
4	>23 years	2	2%
Total		**100**	**100%**

Source: Data Processing Results (2023)

Based on table 4.3 above, it shows that respondents aged 20-21 years were 63%, followed by respondents aged 22-23 years at 22%. This shows that the use of the marketplace is widely used by respondents in the 20-21 year age range. Because basically this age range is the age that is quicker to adopt new technology, is open to innovation, is influenced by social media, has a dynamic lifestyle, and tends to be responsive to price offers and discounts offered by the marketplace, causing the intensity of use to also increase.

c. Purchase Frequency

Table 3 Respondent Identity Based on Purchase Frequency

No	Frequency	Respondent	Percentage (%)
1	1-2 times	11	11%
2	3-5 times	30	30%
3	>10 times	59	59%
Total		**100**	**100%**

Source: Data Processing Results (2023)

Based on table 4.7 above, it was found that 59% of respondents had used and transacted on Shopee more than 10 times in the last year. Meanwhile, 30% of respondents had made transactions 3-5 times and 11% had made transactions 1-2 times in the last year.

The results obtained from this data show that there is a high level of use and trust in the Shopee platform.

Data analysis method

Validity test

1. Neuromarketing Validity Test (X1)

Table 4 Neuromarketing Validity Test Results

No	Statement	Rcount	Rtable	Information
1	X1.1	0.579	0.196	Valid
2	X1.2	0.635	0.196	Valid
3	X1.3	0.694	0.196	Valid
4	X1.4	0.667	0.196	Valid
5	X1.5	0.755	0.196	Valid
6	X1.6	0.813	0.196	Valid

Source: Data Processing Results (2023)

In the table above, it is known that all statement items in the neuromarketing variable (X1) have a calculated r value exceeding 0.196. Referring to these results, the 6 statements contained in the neuromarketing variable (X1) are valid so they are suitable to be used as instruments for measuring variables in this research.

2. Test the Validity of User Interface Variables (X2)

Table 5 User Interface Validity Test Results

No	Statement	Rcount	Rtable	Information
1	X2.1	0.664	0.196	Valid
2	X2.2	0.719	0.196	Valid
3	X2.3	0.745	0.196	Valid
4	X2.4	0.748	0.196	Valid
5	X2.5	0.749	0.196	Valid
6	X2.6	0.699	0.196	Valid
7	X2.7	0.750	0.196	Valid
8	X2.8	0.750	0.196	Valid
9	X2.9	0.751	0.196	Valid
10	X2.10	0.745	0.196	Valid

Source: Data Processing Results (2023)

In the table above, it is known that all statement items in the user interface variable (X2) have a calculated r value exceeding 0.196. Referring to these results, the 10 statements contained in the user interface variable (X2) are valid so they are suitable to be used as instruments for measuring variables in this research.

3. Test the Validity of the Consumer Satisfaction (Y) Variable

Table 6 Consumer Satisfaction Validity Test Results

No	Statement	Rcount	Rtable	Information
1	Y1	0.835	0.196	Valid
2	Y2	0.853	0.196	Valid
3	Y3	0.862	0.196	Valid
4	Y4	0.782	0.196	Valid
5	Y5	0.787	0.196	Valid
6	Y6	0.846	0.196	Valid

Source: Data Processing Results (2023)

In the table above, it is known that all statement items in the consumer satisfaction (Y) variable have a calculated r value exceeding 0.196. Referring to these results, the 6 statements contained in the consumer satisfaction (Y) variable are valid so they are suitable to be used as instruments for measuring variables in this research.

Reliability Test

1. Neuromarketing Variable Reliability Test (X1)

Table 7 Reliability Test Results for Neuromarketing Variables Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.778	6

Source: Data Processing Results (2023)

Based on the data in the table above, the reliability coefficient for the neuromarketing variable (X1) is 0.778. This means that variable X1 has a reliability coefficient value greater than 0.6. Thus, all statements in the neuromarketing variable (X1) can be trusted and are reliably used in research.

2. User Interface Variable Reliability Test (X2)

Table 8 Reliability Test Results for User Interface Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.900	10

Source: Data Processing Results (2023)

Based on the data in the table above, the reliability coefficient for the user interface variable (X2) is 0.900. This means that variable X2 has a reliability coefficient value greater than 0.6. Thus, all statements in the user interface variable (X2) can be trusted and reliably used in research.

3. Consumer Satisfaction (Y) Variable Reliability Test

Table 9 Reliability Test Results for Consumer Satisfaction Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.908	6

Source: Data Processing Results (2023

Based on the data in the table above, the reliability coefficient for the consumer satisfaction variable (Y) is 0.908. This means that variable Y has a reliability coefficient value greater than 0.6. Thus, all statements in the consumer satisfaction (Y) variable can be trusted and reliably used in research.

Classic assumption test

Normality test

1. Kolmogorov-Smirnov

Table 10 Kolmogorov Smirnov Normality Test Results

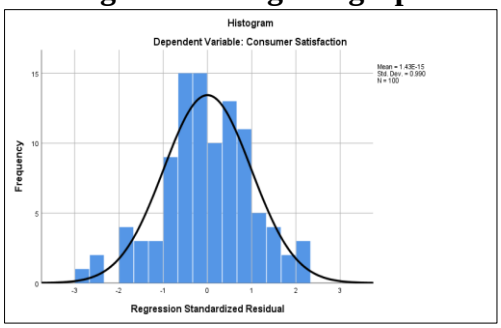
One-Sample Kolmogorov-Smirnov Test		
		Unstandardized
N		100
Normal Parameters [a, b]	Mean	.0000000
	Std. Deviation	1.49765658
Most Extreme Differences	Absolute	,088
	Positive	,043
	Negative	-.088
Asymp. Sig. (2-tailed)		,056 [c]

Source: Data Processing Results (2023)

In the table above, the value obtained through the *Kolmogorov-Smirnov test* was found to be 0.056. Based on the provisions, this value exceeds the specified limit value to say that the data is normally distributed, namely 0.05. So it can be said that the data obtained in this study is normally distributed and meets the assumptions of the normality test.

2. Histogram Graph

Figure 1 Histogram graph

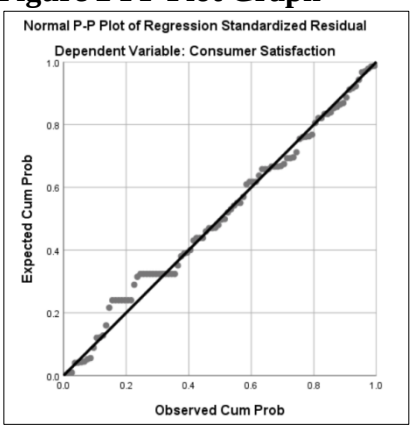


Source: Data Processing Results (2023)

In the picture above, it can be seen and known that the data is normally distributed which can be observed through the histogram graph which is bell-shaped and is not significantly skewed to the left or right. Generally, the histogram graph data in the image above can be said to be normal because the data is spread around the diagonal line and also follows the direction of the diagonal line or histogram graph.

3. P–P Plot Graph

Figure 2 PP Plot Graph



Source: Data Processing Results (2023)

Multicollinearity Test

Table 11 Multicollinearity Test Results

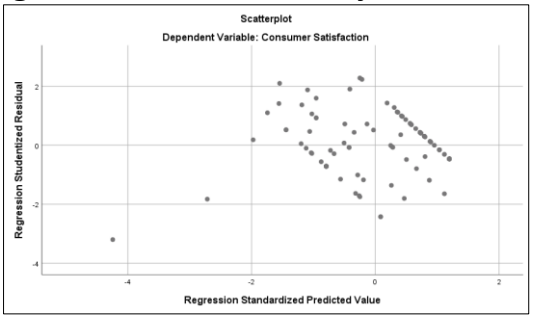
Coefficients [a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Neuromarketing	,540	1,851
	User Interface	,540	1,851
a. Dependent Variable: Consumer Satisfaction			

Source: Data Processing Results (2023)

Based on the table above, you can see the tolerance values for the neuromarketing and user variables interface is 0.540 which means it is greater than > 0.10 and with a VIF value of 1.851 which means it is smaller than < 10.00. From these results it can be concluded that there are no symptoms of multicollinearity and the regression model is said to be feasible and can be used for the regression equation.

Heteroscedasticity Test

Figure 12 Heteroscedasticity Test Results



Source: Data Processing Results (2023)

Based on the data in the image above, it can be observed that the points on the Scatterplot graph are spread randomly at number 0 both below and above the Y axis and do not form a clear pattern. The data displayed can be concluded that the regression model used does not occur heteroscedasticity.

Multiple Linear Regression Analysis

Table 13 Results of Multiple Linear Regression Analysis

Coefficients [a]			
Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	2,579	1,366
	Neuromarketing	,229	,053
	User Interface	,425	.041
a. Dependent Variable: Consumer Satisfaction			

Source: Data Processing Results (2023)

Based on the results in the table above, the linear equation in this research is as follows:

$$\mathbf{Y = 2.579 + 0.229\ X1 + 0.425\ X2}$$

From the equation above, it can be used as a reference to be interpreted as follows:

1. The constant coefficient is 2.579, which means that the independent variables are neuromarketing (X1) and user interface (X2) has a value of 0 (zero), then the consumer value satisfaction (Y) is 2.579.
2. neuromarketing regression coefficient (X1), is 0.229, meaning that for every increase in the X1 value of 1 unit, the consumer satisfaction (Y) will increase by 0.229. The coefficient has a positive value, meaning there is a positive relationship between the neuromarketing variable (X1) and the consumer satisfaction variable (Y). The higher the value of variable X1, the higher the Y value will be.
3. The user interface regression coefficient (X2) is 0.425, meaning that for every increase in the X2 value of 1 unit, the consumer satisfaction (Y) will increase by 0.425. The coefficient has a positive value, meaning there is a positive relationship between user interface variable (X2) and consumer satisfaction variable (Y). The higher the value of variable X2, the higher the Y value will be.

Hypothesis test

1.Partial Significance Test (T Test)

Table 14 Results of Partial Significance Test (T Test)

Coefficients [a]			
Model		t	Sig.
1	(Constant)	1,888	,062
	Neuromarketing	4,344	,000
	User Interface	10,325	,000
a. Dependent Variable: Consumer Satisfaction			

Source: Data Processing Results (2023)

Based on the test results according to the table above, namely:

1. Hypothesis testing shows that the value of neuromarketing's influence (X1) is significant on consumers satisfaction (Y) is 0.000 < 0.05 and the t value is 4.344 > t table 1.985. This shows that the neuromarketing variable (X1) has a positive and significant effect on consumers satisfaction (Y). So it can be concluded that Ha1 is accepted and H01 is rejected.
2. Hypothesis testing shows that the value of user influence is significant interface (X2) to consumers satisfaction (Y) is 0.000 < 0.05 and the t value is 10.325 > t table 1.985. This shows that the user variable interface (X2) has a positive and significant effect on consumers satisfaction (Y). So it can be concluded that Ha2 is accepted and H02 is rejected.

2. Simultaneous Test (F Test)

Table 15 Simultaneous Significance Test Results (F Test)

ANOVA [a]			
Model		Mean Square	F
1	Regression	394,668	172,403
	Residual	2,289	
	Total		
a. Dependent Variable: Consumer Satisfaction			

Source: Data Processing Results (2023)

Based on the results in the table above, it can be seen that the significance value is the influence of *neuromarketing* (X1) and *the user interface* (X2) together or simultaneously with consumer satisfaction variable is 0.000 < 0.05 and the calculated f

value is 172,403 > 3.090. These results prove that the two independent variables are neuromarketing and user interface has a simultaneous or joint effect on the dependent variable, namely the consumer satisfaction .

3.Coefficient of Determination Test (R2)

Table 16 Determination Coefficient Test Results (R2)

Model Summary [b]		
Model	R	Adjusted R Square
1	,883 [a]	,776
a. Predictors: (Constant), User Interface, Neuromarketing		
b. Dependent Variable: Consumer Satisfaction		

Source: Data Processing Results (2023)

Based on the results of data processing in the table above, it can be explained, based on the results of the termination test, an R value of 0.883 was obtained, where this coefficient value shows the relationship between neuromarketing (X1) and user interface (X2) on consumer satisfaction of 88.3% so that the relationship between these variables can be categorized very closely. Meanwhile, the Adjusted R Square value or coefficient of determination value above shows that the neuromarketing (X1) and user interface (X2) variables on consumer satisfaction (Y) are 77.6% while the remaining 22.4% is influenced by other variables not discussed in this research.

The Influence of Neuromarketing on Consumer Satisfaction

Based on the results of the partial test (t-test), the calculated t value of 4.344 is greater than the t table of 1.985 or 4.344 > 1.985 and has a significant value of 0.000 < 0.05, which means Ha1 is accepted. So it can be interpreted that neuromarketing (X1) has a positive and significant effect on consumer satisfaction (Y), because understanding consumers' emotional responses and perceptions of products allows adjusting marketing strategies to create a more satisfying experience.

The results of this research are in line with the theoretical basis put forward by Dr. Anil Sharma, *et al* (2023) that Neuromarketing uses neuroimaging techniques in market research to better understand how people react to marketing stimuli such as products, advertising, and others. The results of this research are also supported by previous research conducted by Berkatni Agustriana Intansari (2021) with research results showing that neuromarketing has a beneficial influence on consumer purchasing decisions and increases sales.

The Influence of User Interface on Consumer Satisfaction

Based on the results of the partial test (t-test), the calculated t value of 4.344 is greater than the t table of 1.985 or 4.344 > 1.985 and has a significant value of 0.000 < 0.05, which means Ha1 is accepted. So it can be interpreted that the user interface (X2) has a positive and significant effect on consumer satisfaction (Y). This indicates that improving the quality of the user interface can significantly increase the level of consumer satisfaction with the products or services offered.

The results of this research are in line with the theoretical basis put forward by Mulyana (2019: 103) which states that the user interface is a communication mechanism between the user and a program system in the form of a mobile website, or software where the mechanism is adjusted to the user's needs. The results of this research are also supported by previous research conducted by Sabar, Rosiana Eka Dewi (2022) with research results showing that the user interface on digital platforms can attract users' interest in continuing to use the services provided to search for information and interesting

digital platform pages can increase the positive emotions of users and influence psychological behavior.

The Influence of Neuromarketing (X1) and User Interface (X2) on Consumer Satisfaction (Y)

Based on the results of the research description above, it can be obtained that neuromarketing (X1) and user interface (X2) have a significant effect on consumer satisfaction (Y). This means that a deep understanding of consumer's emotional responses and perceptions (neuromarketing) together with the user interface has a significant impact in increasing consumer satisfaction. By combining aspects of neuromarketing and a good user interface, companies can create a unique consumer experience

CONCLUSION

This research proves that neuromarketing (X1) has a positive and significant effect on the consumer satisfaction variable (Y) among students at the Universitas Sumatera Utara who use the Shopee platform in Medan. And the user interface variable (X2) has a positive and significant effect on the consumer satisfaction variable (Y) among students at the Universitas Sumatera Utara who use the Shopee platform in Medan. And for the Adjusted Square value of 0.776 or the determinant coefficient value shown, the neuromarketing (X1) and user interface (X2) variables on consumer satisfaction (Y) are 77.6%, while the remaining 22.4% is influenced by other factors in outside this research.

Shopee is expected to carry out evaluations, implement improvements, proactively communicate with consumers, strengthen customer service, and increase transparency to respond and increase consumer satisfaction so that Shopee can overcome and correct discrepancies in expectations which are the lowest rated, increase consumer trust, maintain consumer loyalty, and strengthen its brand reputation in the e-commerce market.

CONFLICT OF INTEREST

The authors do not have any conflict of interest in the publication of this research. All contents in this research are the responsibility and work of the author and have never been published in other media.

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