

Analysis of the Impact of UI/UX Elements on User Satisfaction and Loyalty In E-Commerce Platforms: An Empirical Study on the Tokopedia Platform

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ABSTRACT

The increasingly intense competition in Indonesia's e-commerce industry is compelling platforms like Tokopedia to shift from price war strategies to enhancing user experience to build long-term loyalty. This study aims to analyze the influence of User Interface (UI) and User Experience (UX) elements on User Satisfaction and User Loyalty on the Tokopedia platform. Specifically, this research also examines the mediating role of User Satisfaction in the relationship between UI/UX and User Loyalty.

This research utilizes a quantitative approach with non-probability sampling through a purposive sampling technique. Data were collected via an online questionnaire distributed to 150 active Tokopedia users residing in the Jabodetabek area. The data analysis technique used is Partial Least Squares Structural Equation Modeling (PLS-SEM) with the SmartPLS 4 software.

The results indicate that User Interface (UI) and User Experience (UX) have a positive and significant effect on User Satisfaction. Subsequently, User Satisfaction is also proven to have a positive and significant effect on User Loyalty. However, the key finding of this research is the insignificance of the direct effects of UI and UX on User Loyalty. Further analysis confirms the role of User Satisfaction as a full mediation variable. This indicates that the entire influence of UI and UX on User Loyalty is fully channeled through User Satisfaction.

This study concludes that satisfaction is a crucial strategic bridge that must be crossed to convert a good user experience into tangible customer loyalty. The implication for Tokopedia is that investments in UI/UX improvements will not be effective in increasing loyalty if they are not accompanied by strategies that ensure these features genuinely satisfy users first.

Keywords: *E-commerce, PLS-SEM, Tokopedia, User Experience, User Interface, User Loyalty User Satisfaction.*

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INTRODUCTION

The development of digital technology has brought about major changes in the way consumers interact with products and services. Recently, e-commerce is very popular all over the world with many latest technologies offered. The e-commerce industry in Indonesia has experienced rapid growth in recent years driven by increased Internet usage, easy access via mobile devices, and changes in consumer behavior that are increasingly accustomed to shopping online (Harahap et al., 2024). According to Statistia Report (2023), the number of e-commerce users in Indonesia is predicted to increase to 189.6 million users by 2024 as shown in Figure 1.

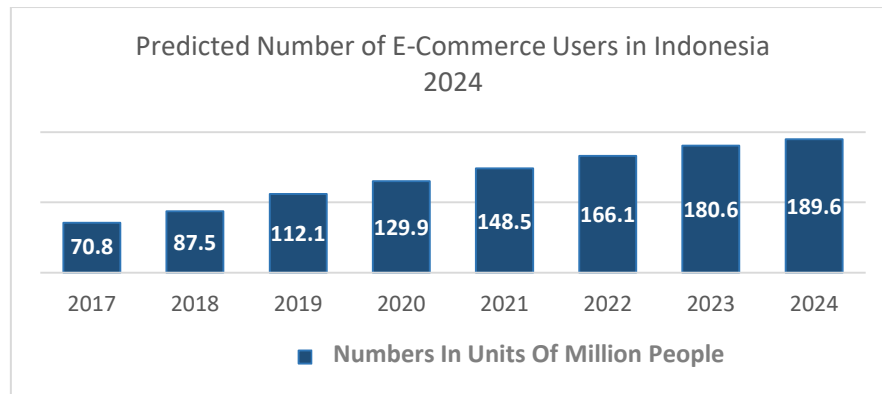


Figure 1. Predicted Number of E-Commerce Users in Indonesia 2024

Source: Researcher Processed Data based on Statista (2023) and DataReportal (2023)

In addition, according to Google, Tamasek, and Bran & Company (2022), the value of Indonesia's digital economy is predicted to reach USD 130 billion by 2025, with e-commerce as the main sector dominating Indonesia's digital transactions.

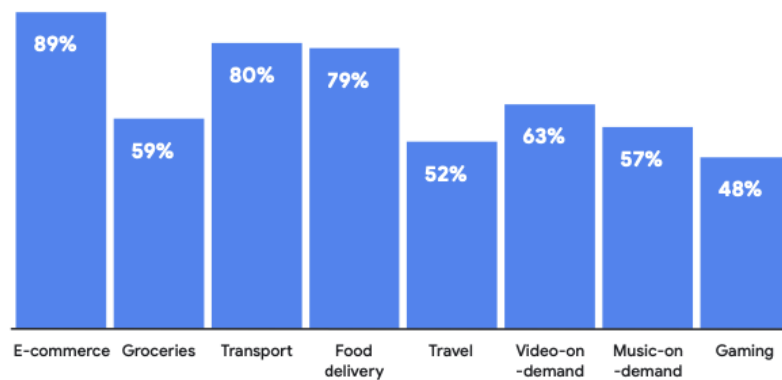


Figure 2. Indonesia's Digital Transaction Sector

Source: Bain Analysis

In the e-commerce industry, there are 5 e-commerce platforms in Indonesia that get the highest number of visits in Q4 of 2023. Where Shopee is the platform with the highest visits of 2.35 billion visits, followed by Tokopedia with a total of 1.25 billion visits, Lazada with 762.4 million visits, Blibli with 334.7 million visits, and Bukalapak in fifth position with 168.2 million visits.

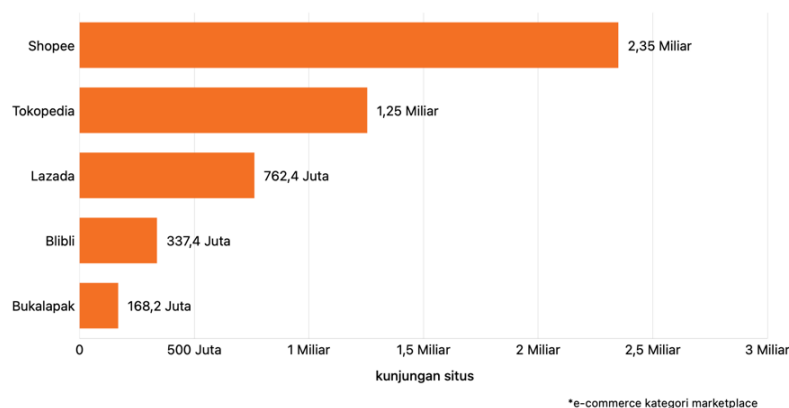


Figure 3. Number of E-Commerce Platform Visits Q4 2023

Source: Kataboks by Katadata

Although not in the first place, Tokopedia is interesting to study because it has very active digital product development dynamics. The high number of visits shows that Tokopedia still has strong appeal and relevance in the midst of digital industry competition. Since joining the GoTo Group. Tokopedia has also shown significant digital transformation dynamics, including in the

aspects of user interface (UI) and user experience (UX), such as the integration of GoPay and GoSend services, simplification of navigation, and optimization of search features (Anandaska, 2024)

According to Shi et al. (2021), visual and aesthetic aspects in UI can influence users' perceived value and comfort through the aesthetic-usability effect Buker et al., (2024) emphasized that emotion and ease in interface design can increase user self-efficacy and encourage loyalty through higher engagement. Correspondingly, Bai et al., (2022) also showed that aesthetic and easy-to-use UI elements have a significant influence on user loyalty indirectly through user satisfaction.

The UI/UX strategy implemented by each platform results in different user loyalty patterns. Compared to Shopee, Tokopedia's approach is more focused on optimizing features and users than aggressive promotions. Shopee is known to be more transactional, with user loyalty heavily influenced by discount incentives and price campaigns (Negara & Soesilowati, 2021). Meanwhile, Tokopedia faces challenges in terms of interface complexity, design consistency across platforms, and efficiency of search and transaction features, as found in studies and user complaints (Prayoga et al., 2023). Other platforms such as Bukalapak currently focus on the MSME and B2B segments, and Lazada, although part of the Alibaba Group, has not made significant changes in the local interface. While Blibli targets more middle-class user segments with simpler and more stable interactions.

Tokopedia as one of the largest e-commerce platforms in Indonesia continues to face challenges in maintaining user satisfaction and loyalty amid increasingly intense competition. Based on the research of Prayoga et al., (2023) found that suboptimal UI and UX design in Tokopedia can increase user risk perception, which in turn reduces purchasing decisions. In addition, Pynatih et al., (2024) showed that by understanding and improving the user journey (User Journey Mapping), Tokopedia has a great opportunity to improve the quality of user experience and strengthen loyalty.

User Interface (UI) refers to visual and interactive elements in the application, such as layout, colors, icons, and navigation, which serve to improve user experience on e-commerce platforms. Meanwhile, User Experience (UX) covers the overall user experience in using the platform (Susilawati et al., 2024). Previous research, such as that conducted by Gunawan et al., (2021) highlighted the importance of UI/UX design in improving user experience on e-commerce platforms in general. However, this study does not highlight the specific elements of UI/UX that have a significant effect on user satisfaction and loyalty on the Tokopedia platform. Another study found that a positive experience in using an e-commerce platform encourages users to make repeat purchases and increase loyalty to the platform (Kim & Niehm, 2009).

Although various studies have examined the impact of UI/UX on user experience, there are still many limitations in previous research including:

- a. The lack of research that integrates UI and UX together in a structural model of user satisfaction and loyalty. Most previous studies have only tested one aspect (UI or UX) without looking at how the two interact in shaping user satisfaction and loyalty. This study fills this gap by building an integrated model between UI, UX, Satisfaction, and User Loyalty using the PLS-SEM method.
- b. There are still inconsistencies in the results of the relationship between UX and User Loyalty. Some studies, for example Saputra, (2021) show that UX has no direct effect on Loyalty, while other studies Thu et al., (2023) and Susilawati et al., (2024) state the opposite. This study re-examines the relationship and adds an analysis of the mediating role of User Satisfaction (KP) to explain the potential for full or partial mediation.
- c. Previous research rarely explores the most significant indicators in shaping loyalty through satisfaction. Most research stops at the conclusion of "effect" or "no effect", without exploring which elements are most dominant. This study fills the gap by analyzing the contribution of

indicators with a focus on companies in a practical way so that companies know what needs to be prioritized in UI/UX development.

- d. Tokopedia as a research object is still less explored. Tokopedia as a research object is still less explored in depth than other e-commerce such as Shopee. Tokopedia is the second largest e-commerce platform in Indonesia and is also known to focus on feature development and user experience rather than aggressive promotion. It is interesting to test whether this strategy has an impact on satisfaction and loyalty.
- e. The lack of studies that measure indirect relationships through a mediation approach with the PLS-SEM method

This study adopts a quantitative-explanatory approach with bootstrapping techniques in PLS-SEM to get a more accurate and statistically valid picture. This test is not only on the direct effect but also the indirect effect (mediation), so the results are more comprehensive.

Thus, this study not only answers whether UI and UX affect User Satisfaction and Loyalty, but also identifies the most influential UI/UX elements that have not been touched by previous studies. These results are expected to provide theoretical contributions in the development of digital user behavior models as well as practical implications for companies to develop data-driven design strategies. The focus of this research only examines elements of User Interface (UI), User Experience (UX), User Satisfaction (KP), and User Loyalty (LP) with two main considerations. First, UI and UX are the main interaction points of users in digital systems, so changes in these elements have a direct impact on perceptions, comfort, and the decision to continue using the platform. Secondly, UI and UX are aspects that can be controlled and optimized by the app developer, in contrast to external factors such as price and brand trust which are not fully controllable. Thus, by focusing on these four variables, the research is expected to make theoretical and practical contributions to the development of Tokopedia's product design to improve competitiveness in the Indonesian e-commerce industry. Therefore, this study not only aims to test the direct influence of each variable, but also specifically investigates the key role of User Satisfaction as a mediating mechanism that explains how UI and UX can effectively shape User Loyalty on the Tokopedia platform.

METHOD

This research uses a quantitative approach with a survey method to analyze the effect of User Interface (UI) and User Experience (UX) on the satisfaction and loyalty of Tokopedia e-commerce platform users. Data collection was carried out through distributing questionnaires online using Google Forms in January 2025. Respondents in this study are active Tokopedia users who live in the Jabodetabek area, are between 18-35 years old, and have made at least one transaction in the last 6-12 months.

The sampling technique used was purposive sampling with a total of 150 respondents. Determination of this number refers to the guidelines of Hair Jr et al., (2021) for the Partial Least Squares - Structural Equation Modeling (PLS-SEM) method, which is at least 5-10 times the number of indicators on the most complex variables.

Data collection instruments were developed based on latent variables consisting of:

1. Independent variables: User Interface (UI) and User Experience (UX),
2. Mediating variables: User Satisfaction (KP),
3. Dependent variable: User Loyalty (LP).

Each variable is measured through several indicators referenced from previous studies. There are a total of 26 indicators with a 5-point Likert measurement scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

Data analysis was conducted using the PLS-SEM method with the help of SmartPLS software. The research model consists of an outer model (to test the validity and reliability of indicators against

constructs) and an inner model (to test the relationship between latent variables). Validity testing includes convergent (loading factor ≥ 0.7 ; AVE ≥ 0.5) and discriminant (HTMT < 0.90) validity, while reliability is tested through Composite Reliability (CR ≥ 0.7) and Cronbach's Alpha (≥ 0.7).

Hypothesis testing was conducted through a bootstrapping technique with 5000 subsamples. The test criteria were set at a t-statistic value ≥ 1.96 with a significance level of $p < 0.05$. This study evaluates both the direct and indirect effects of UI and UX on user loyalty, with user satisfaction as the mediating variable.

RESULTS AND DISCUSSION

The data from the distribution of the questionnaire was obtained from 150 respondents who met the research criteria, namely Tokopedia users aged 18-35 years who live in Jabodetabek and have made transactions in the last 6-12 months. This sample size has met the minimum requirements for analysis using Partial Least Squares - Structural Equation Modeling (PLS-SEM). Before further analysis is carried out, a research instrument test is first carried out, which includes validity and reliability tests to ensure that the data used is feasible and accurate in measuring the variables under study.

Design and Testing of the Measurement Model (Outer Model)

The first step in data processing is to test the Measurement Model (Outer Model) using the PLS Algorithm method. This evaluation aims to assess the validity and reliability of each indicator used in the study on its latent variable. In the measurement evaluation (Outer Model), the analysis is carried out on reflective indicators which include validity and reliability tests on each indicator variable on the latent variable. The following are the results of the estimation algorithm in PLS analysis to evaluate the outer model used for the measurement model.

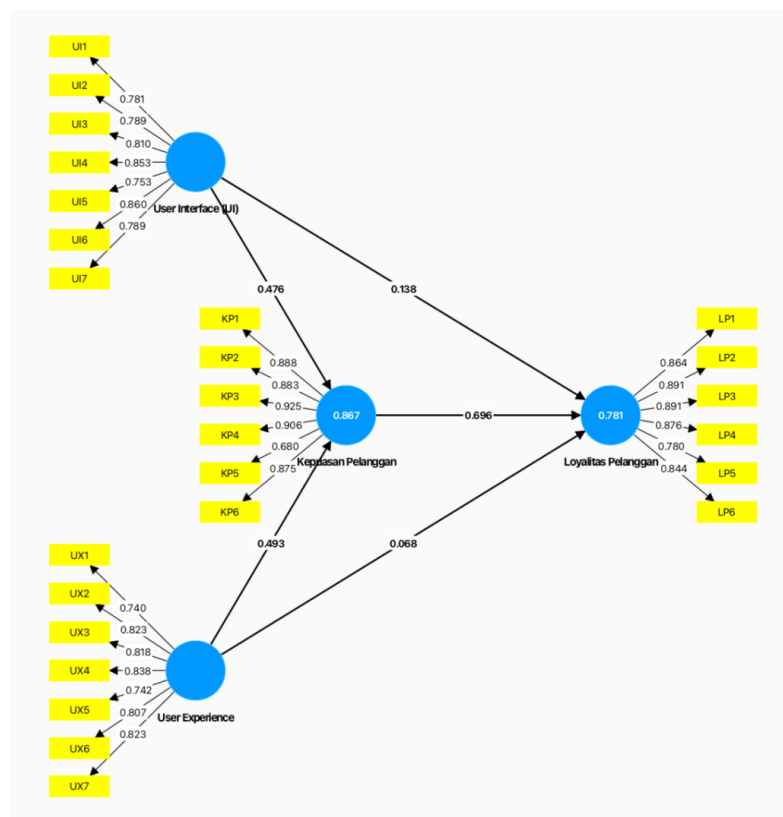


Figure 4. SmartPLS Model 1 Algorithm

Outer Model Evaluation in PLS analysis includes several main aspects:

- a. Convergent Validity: Tests the extent to which indicators in one variable have a high correlation with the latent variable.

- b. Discriminant Validity: Measures how well a latent variable is empirically different from other variables.
- c. Composite Reliability: Assesses the extent to which indicators in one construct have high internal consistency.
- d. Cronbach's Alpha: Measures the reliability and consistency of certain variable indicators.

Based on the test results, the following are the results of the validity and reliability analysis of the measurement model:

Convergent Validity testing is done by looking at the Outer Loading value of each indicator. An indicator is declared to meet convergent validity if it has an outer loading value > 0.70. In addition, Average Variance Extracted (AVE) is also used as a measure of validity, where an AVE value greater than 0.50 indicates that the latent variable can explain more than half of the variance of its indicator. The following are the outer loading and AVE values for each indicator in this study:

Table 1. Outer Loading and Average Variance Extracted (AVE) Values

Variable	Indicator	Outer Loading	Average Variance Extracted (AVE)
User Interface (UI)	UI1	0,781	0,649
	UI2	0,788	
	UI3	0,810	
	UI4	0,853	
	UI5	0,752	
	UI6	0,860	
	UI7	0,789	
User Experience (UX)	UX1	0,739	0,639
	UX2	0,823	
	UX3	0,817	
	UX4	0,839	
	UX5	0,741	
	UX6	0,807	
	UX7	0,824	
Kepuasan Pengguna (KP)	KP1	0,892	0,814
	KP2	0,899	
	KP3	0,935	
	KP4	0,914	
	KP6	0,869	
Loyalitas Pengguna (LP)	LP1	0,864	0,737
	LP2	0,890	
	LP3	0,892	
	LP4	0,876	
	LP5	0,781	
	LP6	0,844	

Source: Results of Data Processing

Based on Table 1, it can be seen that the majority of Outer Loading values for each indicator are above 0.70 so that the indicators used meet Convergent Validity and can be used for further analysis. Thus, it can be concluded that this model has met convergent validity and all indicators are valid in measuring latent variables.

Discriminant Validity

Discriminant Validity is carried out to measure the extent to which latent variables in research can be distinguished from one another. In this study, the discriminant validity test was carried out using the Hererotrait-Monotrait Ratio (HTMT) method. Where the HTMT value should be <0.90 to indicate that latent variables have good discrimination between one another, whereas if the HTMT value is > 0.90 then there is a possibility that the indicators between variables have concepts that are too similar (redundancy) and model improvement is needed.

After retesting, the HTMT values for some correlations remain above 0.9 so that retesting is still needed. In this case, the Cross Loading value is then checked. According to Fornell & Lacker (1981) and Hanseler et al. (2015), indicators that have a high loading value on other constructs compared to their original construct, or have a loading difference that is too small (<0.10) can cause a violation of Discriminant Validity because it shows construct ambiguity. So to overcome this, the researcher selects indicators with the following approach: Indicators with a difference between 0.05 - 0.10 are considered for selective removal based on the order of influence on improving the HTMT value. The first step in improving Discriminant Validity was carried out on the relationship between User Satisfaction (KP) and User Loyalty (LP) because the initial HTMT value was 0.924 which indicated a potential Discriminant Validity problem. To indicate indicators that cause excessive correlation, the Cross Loading value was analyzed manually using Microsoft Excel. Indicators from both constructs were compared to their loading values on other constructs and constructs.

Table 2. HTMT Discriminant Validity Test Results after LP4 is Removed

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,910			
<i>User Experience</i>	0,943	0,792		
<i>User Interface</i>	0,951	0,845	0,917	

Source: Results of Data Processing

After removing LP4, it can be seen that the HTMT value between User Satisfaction and User Loyalty has improved slightly but still exceeds the recommended limit of 0.910. Therefore, the KP4 indicator is removed, which in the previous Cross Loading table also shows a fairly high loading value on the LP construct (0.5965).

Table 3. HTMT Test Results After KP4 is Removed

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,833			
<i>User Experience</i>	0,956	0,792		
<i>User Interface</i>	0,960	0,845	0,917	

Source: Results of Data Processing

After the removal of KP4, the HTMT value between User Satisfaction and User Loyalty has dropped to 0.8333, which means that Discriminant Validity between these two constructs has been met. However, there is still a high correlation between User Satisfaction and two other constructs, namely User Experience and User Interface which will be discussed in the next step.

After the Discriminant Validity between User Satisfaction (KP) and User Loyalty (LP) was successfully improved, the next step focused on the relationship between User Experience (UX) and User Satisfaction (KP). The initial HTMT value for this relationship is 0.951, which exceeds the recommended threshold (<0.90), indicating the potential for significant Construct Overlap. To identify

the source of the problem, an analysis of the Cross Loading value between the UX and KP indicators is carried out. The results are presented in Table below:

Table 4. HTMT Test Results After UX4 is Removed

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,883			
<i>User Experience</i>	0,936	0,770		
<i>User Interface</i>	0,960	0,845	0,905	

Source: Results of Data Processing

Even though UX4 has been removed, the HTMT value between User Satisfaction and User Experience is still above the threshold of 0.936. Therefore, additional deletion was carried out on the KP6 indicator, which based on previous analysis also showed a high cross loading value.

Table 5. HTMT Test Results After KP6 is Removed

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,886			
<i>User Experience</i>	0,896	0,770		
<i>User Interface</i>	0,950	0,845	0,905	

After the removal of KP6, Discriminant Validity between User Experience and User Satisfaction has been met with an HTMT value of 0.896 which is below the 0.90 threshold. However, two other relationships still have not met Discriminant Validity, namely between User Interface and User Satisfaction (0.950) and User Satisfaction and User Interface (0.950). Improvements for these relationships are discussed at a later stage.

The process of improving Discriminant Validity is to improve the relationship between User Satisfaction (KP) and User Interface (UI). The initial HTMT value for this relationship is 0.958 which indicates an overly high correlation between the two constructs. This may indicate that some UI indicators semantically overlap with KP indicators.

Table 6. HTMT Test Results After Removing UI3

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,886			
<i>User Experience</i>	0,896	0,770		
<i>User Interface</i>	0,932	0,845	0,901	

After removing UI3, the HTMT value still does not meet the threshold (<0.90). So continue by removing the next indicator that has a low loading difference, namely UI7.

Table 7. HTMT Test Results After UI7 is Removed

	Kepuasan Pegguna	Loyalitas Pegguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pegguna				
Loyalitas Pegguna	0,886			
<i>User Experience</i>	0,896	0,770		
<i>User Interface</i>	0,907	0,830	0,890	

Source: Results of Data Processing

Despite the decrease in HTMT values, Discriminant Validity between KP and UI was still not achieved. Finally, indicator UI6 was removed, which also showed high cross-coding values with KP.

Table 8. HTMT Test Results After UI6 was Removed

	Kepuasan Pengguna	Loyalitas Pengguna	<i>User Experience</i>	<i>User Interface</i>
Kepuasan Pengguna				
Loyalitas Pengguna	0,886			
<i>User Experience</i>	0,896	0,770		
<i>User Interface</i>	0,889	0,811	0,868	

Source: Results of Data Processing

After the removal of UI3, UI7, and UI6, the Discriminant Validity between User Satisfaction and User Interface has been met with an HTMT value of 0.889, in accordance with the threshold of <0.90. In addition, the deletion of UI7 and UI6 also had an impact on reducing the HTMT value between User Interface and User Experience from 0.901 to 0.890 and ended at a value of 0.868.

After a series of model improvements through the removal of indicators that have high cross loading that causes conceptual overlap between constructs, all Heretotrait-Monotrait Ratio (HTMT) values in this model have been below the 0.90 threshold, which indicates that the discriminant validity in this model has been ideally met. The decrease in the HTMT value after the cross loading evaluation proves that the deleted indicators do cause conceptual overlap, so the model curation step is able to increase the discriminant power between constructs. Thus it can be concluded that Discriminant Validity between constructs in this research model has been ideally fulfilled, which shows that each latent variable in this study is able to represent different concepts clearly and not overlap each other. The final model obtained from the results of selecting indicators is as follows:

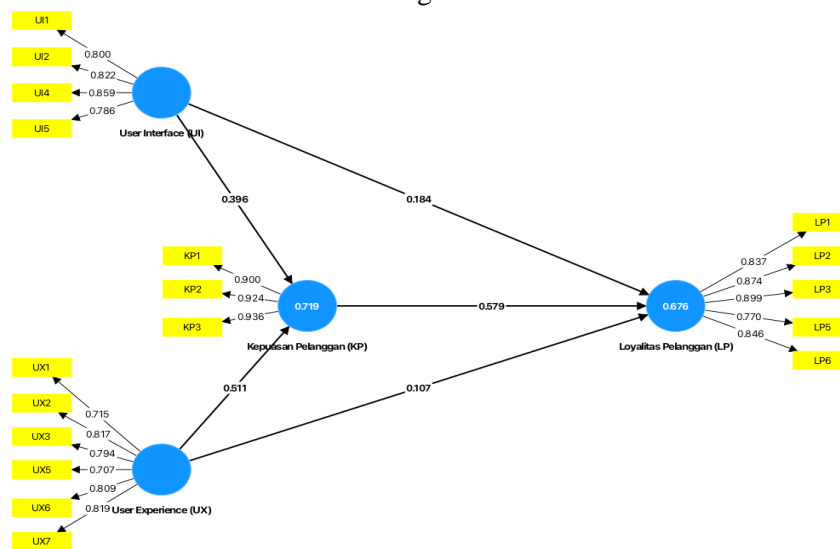


Figure 5. SmartPLS Model 2 Algorithm

Design and Testing of Structural Models (Inner Model)

Inner Model or Structural Model is used to describe the causal relationship between latent variables in this study. Evaluation of the structural model is carried out through several indicators, namely R-Square (R2), Q-Square (Q2), and F-Square (F2), which are used to measure the level of predictive accuracy and the magnitude of the influence of each exogenous variable on endogenous.

1. R-Square (R2) Value

Evaluation of the structural model is carried out by R-Square (R2) analysis to assess the level of goodness-of-fit of the developed model. Based on the results of the analysis using Partial Least Squares (PLS), the R-Square value for each latent variable in the model is shown in Table 9 below:

Table 9. Model R-Square Value

Latent Variable	R-Squares	Description
User Satisfaction	0,719	The model has moderate predictive ability of User Satisfaction (Hair et al. 2022)
User Loyalty	0,676	The model has moderate predictive ability of User Loyalty (Hair et al. 2022)

Source: Results of Data Processing

From the R-Square test results, an R-Square value of 0.719 was obtained for the User Satisfaction variable, which means that the combination of User Interface (UI) and User Experience (UX) is able to explain 71.9% of the variability of User Satisfaction. As for the User Loyalty variable, the R-Square value of 0.676 is obtained, which means that the combination of User Interface, User Experience, and User Satisfaction is able to explain 67.6% of the variability of User Loyalty. Thus, both R-Square values fall into the moderate predictive ability category, which indicates that the model has a fairly good level of accuracy in predicting the dependent variable under study. These results also strengthen the relevance of the model in explaining the influence of UI and UX on User Satisfaction and Loyalty in the context of Tokopedia users.

2. F-Square Value (F2)

The F-Square Value (F2) analysis is carried out to determine the individual contribution of each exogenous variable to the endogenous variable. The F2 value shows how much the impact of deleting one exogenous variable will affect the R2 value of the endogenous variable. According to Hair et al. (2022), the interpretation of the F2 value is as follows:

$F2 \geq 0.02$ = Small effect,

$F2 \geq 0.15$ = Medium effect (medium),

$F2 \geq 0.35$ = Large effect.

Table 10. Model F-Square Value

Relationship between Variables	F-Squares	Interpretation
UX → Kepuasan Pengguna (KP)	0,415	Large
UI → Kepuasan Pengguna (KP)	0,250	Medium
KP → Loyalitas Pengguna (LP)	0,290	Medium
UX → Loyalitas Pengguna (LP)	0,011	Not Significant
UI → Loyalitas Pengguna (LP)	0,037	Small

Source: Results of Data Processing

These results show that:

User Experience (UX) has a major influence on User Satisfaction.

User Interface (UI) has a moderate influence on User Satisfaction.

User Satisfaction acts as a mediator with a moderate influence on User Loyalty.

Meanwhile, UX and UI have a weak direct influence on User Loyalty, indicating that the effect of UI/UX on loyalty is more effective through satisfaction mediation.

Hypothesis testing in this study was carried out using the bootstrapping method in SmartPLS software with a subsample of 5000 and a significance level of 0.1 (two-tailed). This test aims to see the causal relationship between the independent variable and the dependent variable based on the path coefficients, T-statistic value, and p-value. Based on the test results, the hypothesis testing results are shown in Table below:

Table 11. Research Hypothesis Test (Bootstrapping)

Hypothesis	Path Coefficient	T-statistic	p-Value	Decision on H0
User Interface (UI) → Kepuasan Pengguna (KP)	0,396	5,561	0,000	Rejected
User Experience (UX) → Kepuasan Pengguna (KP)	0,511	7,119	0,000	Rejected
Kepuasan Pengguna (KP) → Loyalitas Pengguna (LP)	0,579	5,561	0,000	Rejected
User Interface (UI) → Loyalitas Pengguna (LP)	0,184	1,945	0,052	Accepted
User Experience (UX) → Loyalitas Pengguna (LP)	0,107	1,182	0,237	Accepted
User Interface (UI) → Kepuasan Pengguna → Loyalitas Pengguna (LP)	0,229	3,653	0,000	Rejected
User Experience (UX) → Kepuasan Pengguna → Loyalitas Pengguna (LP)	0,296	4,296	0,000	Rejected

Table 12. Conclusion of Hypothesis Results

H	Hypothesis	Results
H1	H0: User Interface (UI) has no significant effect on User Satisfaction. H1: User Interface (UI) has a significant effect on User Satisfaction.	Reject H0
H2	H0: User Experience (UX) has no significant effect on User Satisfaction. H1: User Experience (UX) has a significant effect on User Satisfaction.	Reject H0
H3	H0: User Satisfaction has no significant effect on User Loyalty. H1: User Satisfaction has a significant effect on User Loyalty.	Reject H0
H4	H0: User Interface (UI) has no direct influence on User Loyalty. H1: User Interface (UI) has a direct influence on User Loyalty.	Failed Reject H0
H5	H0: User Experience (UX) has no direct influence on User Loyalty. H1: User Experience (UX) has a direct influence on User Loyalty.	Failed Reject H0
H6	H0: User Interface (UI) has no indirect influence on User Loyalty through User Satisfaction. H1: User Interface (UI) has an indirect influence on User Loyalty through User Satisfaction.	Reject H0
H7	H0: User Experience (UX) has no indirect effect on User Loyalty through User Satisfaction. H1: User Experience (UX) has an indirect effect on User Loyalty through User Satisfaction.	Reject H0

Source: Results of Data Processing

Based on the results of hypothesis testing using the bootstrapping method, several important findings were obtained regarding the relationship between variables in this study:

- a. User Interface (UI) and User Experience (UX) variables are proven to have a significant influence on User Satisfaction (KP), with a p-value of 0.000 and a T-statistic that exceeds the value of 1.96, respectively. This indicates that the appearance design and user experience of e-commerce platforms make a real contribution to increasing user satisfaction.

- b. User Satisfaction (KP) is also proven to significantly influence User Loyalty (LP), with a path coefficient of 0.579 and a p-value of 0.000. This shows that users who feel fast with the experience of using the platform tend to remain loyal and continue to use the service.
- c. Another interesting finding is the role of full mediation by User Satisfaction in the relationship between User Interface (UI) and User Experience (UX) to User Loyalty. Ha; this can be seen from the direct effect test results which show that $UI \rightarrow LP$ (p-value = 0.052) and $UX \rightarrow LP$ (p-value = 0.237) are not significant directly, while the indirect relationship between $UI \rightarrow KP \rightarrow LP$ and $UX \rightarrow KP \rightarrow LP$ are both significant (0.000). According to Hair et al. (2022), this situation indicates the presence of Full Mediation, which is when the direct effect is not significant after the mediating variable (KP) is included in the model.

The Mediating Role of User Satisfaction

One of the most significant findings in this study is not in the strength of each hypothesis separately, but in the pattern of relationships formed between variables, namely the central role of User Satisfaction (KP) as a crucial variable in the model. The results of the previous hypothesis testing showed that the direct effect of User Interface (UI) (H4) and User Experience (UX) (H5) on User Loyalty (LP) was found to be insignificant. In contrast, the indirect effect through User Satisfaction (KP), namely H6 and H7, was found to be highly significant. This condition, where the effect of the independent variable on the dependent variable becomes insignificant after the presence of the mediator variable, definitively identifies the existence of full mediation. This leads us to an important conclusion about how Tokopedia users' loyalty is actually formed.

This perfectly mediated finding paints a clear narrative of Tokopedia's psychological user journey. A superior User Interface (UI) and smooth User Experience (UX) are crucial starting points, but they do not automatically create loyalty. The experience must first be processed and evaluated by the user into a positive feeling of satisfaction. It is this satisfaction that acts as the “Emotional and Functional Bridge” that connects the momentary experience with long-term commitment. Without successfully crossing this bridge, the impact of good UI/UX will stop halfway and fail to convert into loyalty. This finding is very much in line with the direction of e-commerce research which emphasizes the importance of the role of mediator variables. Specifically, the mediation model where User Satisfaction becomes the bridge between experience quality and e-loyalty has been validated as a robust model in recent research on the context of digital applications.

Managerially, the implications are very strategic for Tokopedia. Product and marketing teams cannot just focus on launching new UI/UX features and assume it will increase customer retention. The primary focus should shift to measuring the impact of the feature on user satisfaction. The success metric of a new feature should not just be “Is this feature being used?”, but “Is this feature actually making users more satisfied?”. Investments in UI/UX should always be accompanied by feedback mechanisms and satisfaction measurements to ensure the bridge to loyalty is firmly built.

CONCLUSION

Based on the results of data analysis using the Partial Least Squares - Structural Equation Modeling (PLS-SEM) approach, this study successfully answered the five objectives that had been formulated. The empirical findings provide insight into the influence of UI and UX elements on User Satisfaction and Loyalty on the Tokopedia platform. The main conclusions that can be drawn are as follows:

1. User Interface (UI) significantly increases User Satisfaction. Intuitive, visually appealing, and easy-to-navigate interface design proves to be a crucial factor in creating a satisfying experience for Tokopedia users.
2. User Experience (UX) significantly increases User Satisfaction. A smooth, efficient, and hassle-free experience while using the platform is a key driver of user satisfaction.

3. User Satisfaction significantly drives User Loyalty. Satisfied users tend to continue using Tokopedia and have a commitment to remain loyal to the platform.
4. User Interface (UI) improvement does not directly shape User Loyalty. This finding shows that a good interface alone is not enough to make users committed in the long run if it is not accompanied by satisfaction.
5. Improved User Experience (UX) does not directly shape User Loyalty. Just like UI, a good user experience must first translate into satisfaction before it can lead to long-term commitment.

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