

The influence of perceived usefulness and perceived risk on loyalty through satisfaction as an intervening variable for users of Flip fintech application in Semarang City

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Abstract

The growth of fintech services in Indonesia has encouraged the public to shift to more practical digital transactions. Flip offers free interbank transfers with efficient service, but recent user complaints about delayed transactions, limited features, and unresponsive service reveal a gap between expectations and reality. This may reduce user satisfaction and weaken loyalty. This study examines the influence of perceived usefulness and perceived risk on user loyalty, with user satisfaction as a mediating variable. This explanatory research used a quantitative approach with 97 Flip users in Semarang City aged 18 to 35 years as respondents. The sample was obtained through purposive and accidental sampling. Data were collected via questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The results show that perceived usefulness has a significant positive effect on satisfaction and loyalty, while perceived risk negatively affects both. Satisfaction partially mediates the relationship between perceived usefulness and loyalty but does not mediate the effect of perceived risk. Based on these findings, it is recommended that Flip enhance its service by adding features that meet user needs, improving transaction speed and reliability, and providing clearer and more responsive customer support. These efforts are expected to enhance user satisfaction and foster stronger loyalty.

Keywords: Perceived Usefulness; Perceived Risk; User Loyalty; User Satisfaction; Consumer Behavior; FinTech App

1. Introduction

Financial technology (fintech) services in Indonesia have rapidly transformed the way users conduct financial transactions. Digital applications are now widely adopted due to their ability to offer speed, efficiency, and cost-effectiveness. Flip is one of the most prominent fintech platforms that provides interbank transfer services without administrative fees. This feature directly addresses the needs of users who seek convenience and practicality, contributing to the platform's widespread appeal and growth.

Flip has attracted a large user base, but challenges remain in retaining consistent user loyalty over time. The fintech industry is highly competitive, and users can easily switch platforms when their expectations are not met. Complaints from Flip users have highlighted various issues such as delays in transaction processing, limited service features, and poor responsiveness from customer service. These recurring issues suggest a gap between user expectations and the actual service delivered, potentially leading to decreased satisfaction and weakened loyalty.

Negative user feedback further supports these concerns. Based on data from the Google Play Store, Flip received a total of 433 negative reviews from April 2024 to March 2025. These consisted of 353 one-star and 80 two-star ratings. The highest number of complaints occurred in July 2024 with 55 reviews, followed by September 2024 with 43. Such trends

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indicate that user dissatisfaction is not an isolated event, but a growing pattern that may influence user retention and the platform's public perception.

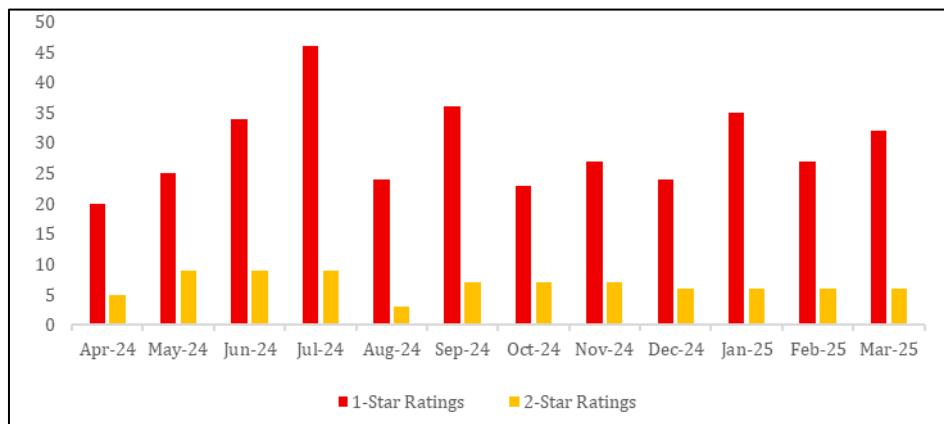


Figure 1 Negative Feedback Trend for Flip on Google Play over the Past Year

Several psychological factors contribute to loyalty in fintech usage, particularly perceived usefulness and perceived risk. Perceived usefulness refers to the extent to which users believe that Flip helps them complete financial tasks effectively. Perceived risk reflects concerns about transaction failures, security, or potential losses. Satisfaction plays a mediating role between these perceptions and loyalty, representing the user's overall evaluation of their experience. This study aims to examine how perceived usefulness and perceived risk affect user loyalty through satisfaction, providing actionable insights for improving Flip's service performance and user retention.

Based on the problems related to Flip user loyalty, the problem formulation that can be formulated and raised in this research is (1) Is there an influence between Perceived Usefulness and User Satisfaction? (2) Is there an influence between Perceived Risk and User Satisfaction? (3) Is there an influence between Perceived Usefulness and User Loyalty? (4) Is there an influence between Perceived Risk and User Loyalty? (5) Is there an influence between User Satisfaction and User Loyalty? (6) Is there an influence between Perceived Usefulness and User Loyalty through User Satisfaction? (7) Is there an influence between Perceived Risk and User Loyalty through User Satisfaction?

2. Material and Methods

2.1. Consumer Behavior

Consumer buying behavior refers to the actions of individuals or households when purchasing goods or services for personal use [1]. This behavior involves observable physical actions rather than internal thoughts or feelings [2]. Four factors influence consumer responses to services, particularly fintech platforms, including cultural, social, personal, and psychological aspects [3].

2.2. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed to explain how users adopt and use information systems [4]. It focuses on two primary constructs, perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which a system improves user performance, while perceived ease of use relates to the level of effort required. TAM was later refined and applied across various domains such as mobile banking and fintech services [5]. This study uses TAM to assess the influence of perceived usefulness and perceived risk on satisfaction and loyalty.

2.3. User Loyalty

User loyalty is defined as a strong commitment to repurchase or continue using a preferred product or service despite the presence of alternatives [3]. Loyalty is measured using the following indicators [3]:

- Repeat purchases
- Retention
- Referrals

2.4. Perceived Usefulness

Perceived usefulness refers to the degree to which using a system is believed to enhance job performance [5]. The following dimensions are used to measure this construct [5]:

- Using the system improves my performance in my job
- Using the system in my job increases my productivity
- Using the system enhances my effectiveness in my job
- I find the system to be useful in my job.

2.5. Perceived Risk

Perceived risk is defined as the uncertainty faced by consumers when outcomes of their decisions are unpredictable [6]. The dimensions used to assess perceived risk include [6]:

- Functional risk
- Financial risk
- Psychological risk
- Time risk

2.6. User Satisfaction

User satisfaction refers to a condition in which users feel positively toward a product or service, leading to continued use and favorable word-of-mouth, while dissatisfaction may result in switching behavior [7]. The indicators used to assess satisfaction are based on the following aspects [3]:

- Experience
- Expectation
- Needs

2.7. Research Method

This study applies an explanatory quantitative approach, utilizing non-probability sampling through a combination of purposive and accidental techniques to select respondents who meet the research criteria [8]. The population consists of Flip application users in Semarang City aged between 18 and 35 years, with a total of 97 valid responses collected. Data were gathered using an offline questionnaire distributed in shopping malls, employing a five-point Likert scale to measure levels of agreement [8]. The research variables, including perceived usefulness, perceived risk, user satisfaction, and user loyalty, were measured using indicators adapted from previous validated studies [3, 5-7]. The data analysis was conducted using the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS) approach, employing the embedded two-stage approach [9]. This involved the evaluation of both the measurement model and the structural model [9], and the data were processed using SmartPLS version 4.0 for Windows.

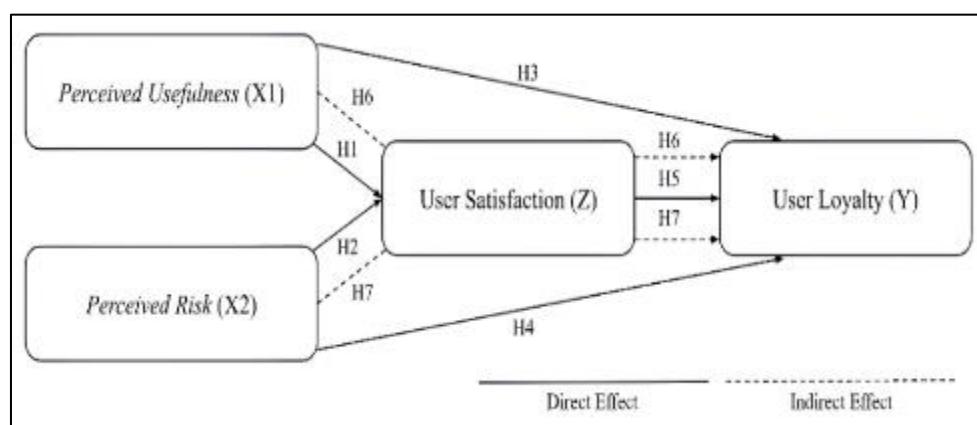


Figure 2 Hypothesis Model

2.8. Hypothesis

2.8.1. *The influence of Perceived Usefulness on User Satisfaction*

Perceived usefulness has been demonstrated to positively affect user satisfaction in the context of digital financial applications. This relationship reflects that users who perceive higher utility from the application tend to report greater levels of satisfaction [10,11].

H1: Perceived usefulness is presumed to have a positive and significant influence on user satisfaction.

2.8.2. *The influence of Perceived Risk on User Satisfaction*

Perceived risk is found to negatively influence user satisfaction, particularly when users feel uncertain about transaction outcomes. The greater the perceived risk, the lower the satisfaction users experience when using the platform [12,13].

H2: Perceived risk is presumed to have a negative and significant influence on user satisfaction.

2.8.3. *The influence of Perceived Usefulness on User Loyalty*

Previous studies have identified that perceived usefulness contributes positively to user loyalty. When users consider an application to be helpful and effective, they are more likely to continue using it over time [11,14].

H3: Perceived usefulness is presumed to have a positive and significant influence on user loyalty.

2.8.4. *The influence of Perceived Risk on User Loyalty*

Research shows that higher perceived risk leads to a decrease in user loyalty. Users who feel insecure or doubtful about a platform are less likely to remain committed to it [13,15].

H4: Perceived risk is presumed to have a negative and significant influence on user loyalty.

2.8.5. *The influence of User Satisfaction on User Loyalty*

User satisfaction has a strong influence on loyalty across various service platforms. When users' expectations and experiences are met, they tend to recommend and continue using the application [16,17].

H5: User satisfaction is presumed to have a positive and significant influence on user loyalty.

2.8.6. *The influence of Perceived Usefulness on Loyalty through Satisfaction*

Several studies indicate that user satisfaction mediates the effect of perceived usefulness on loyalty. This suggests that usefulness enhances satisfaction, which in turn drives loyalty [10,14].

H6: Perceived usefulness is presumed to positively and significantly influence user loyalty through user satisfaction as a mediating variable.

2.8.7. *The influence of Perceived Risk on Loyalty through Satisfaction*

Satisfaction also mediates the relationship between perceived risk and loyalty. Although risk may reduce satisfaction, its influence on loyalty can be partially offset if users still feel satisfied with the service overall [12,15].

H7: Perceived risk is presumed to negatively and significantly influence user loyalty through user satisfaction as a mediating variable.

3. Results

3.1. Evaluation of Measurement Model (Outer Model)

The measurement model, also known as the outer model, describes the relationship between latent variables and the set of indicators used to measure each construct [9].

3.1.1. First Stage of Embedded Two-Stage Approach

The first stage of SEM-PLS analysis using this approach focuses on examining the main effects of the PLS model by analyzing the dimensional level and generating latent variable scores [9].

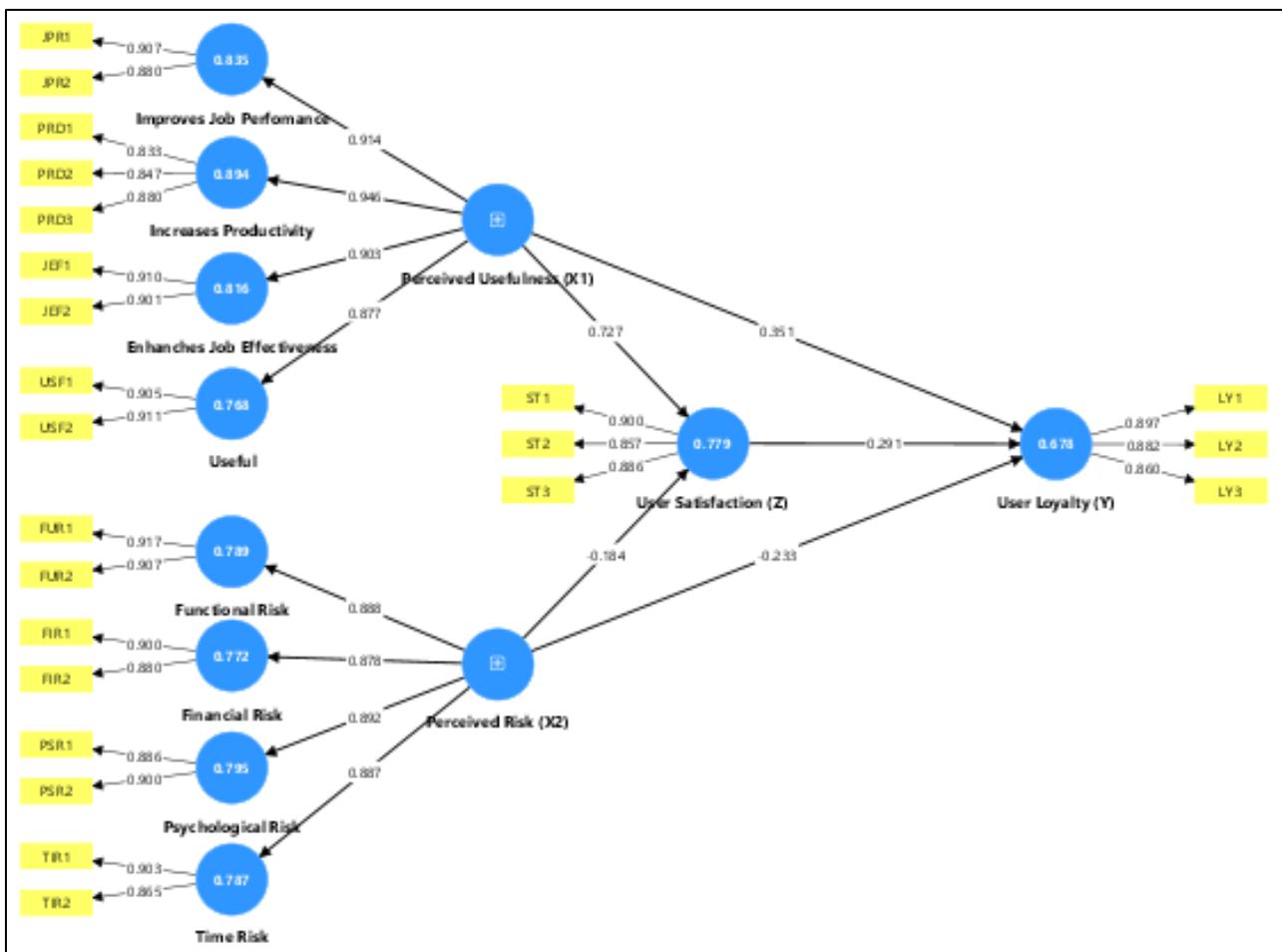


Figure 3 Path Diagram of the Measurement Model (Stage 1)

Convergent Validity

Table 1 shows that all indicators within each dimension obtain loading factors greater than 0.70. This indicates that the latent constructs at the dimensional level are acceptable, as they are well represented by their respective indicators [9].

Table 1 Outer Loadings Results (Stage 1)

Indicator	Dimension	Variable	Loading Factor	Type (as defined)	Description
First Order					
ST1	Experience	User Satisfaction	0.900	Reflective	Valid
ST2	Expectation		0.857	Reflective	Valid
ST3	Needs		0.886	Reflective	Valid
LY1	Repeat Purchase	User Loyalty	0.897	Reflective	Valid
LY2	Retention		0.882	Reflective	Valid
LY3	Referrals		0.860	Reflective	Valid

Indicator	Dimension	Variable	Loading Factor	Type (as defined)	Description	
Second Order						
JPR1	Improves Job Performance	Perceived Usefulness	0.907	Reflective	Valid	
JPR2			0.880	Reflective	Valid	
PRD1	Increases Productivity		0.833	Reflective	Valid	
PRD2			0.847	Reflective	Valid	
PRD3			0.880	Reflective	Valid	
JEF1	Enhances Job Effectiveness		0.910	Reflective	Valid	
JEF2			0.901	Reflective	Valid	
USF1	Useful		0.905	Reflective	Valid	
USF2			0.911	Reflective	Valid	
FUR1	Functional Risk	Perceived Risk	0.917	Reflective	Valid	
FUR2			0.907	Reflective	Valid	
FIR1	Financial Risk		0.900	Reflective	Valid	
FIR2			0.880	Reflective	Valid	
PSR1	Psychological Risk		0.886	Reflective	Valid	
PSR2			0.900	Reflective	Valid	
TIR1	Time Risk		0.903	Reflective	Valid	
TIR2			0.865	Reflective	Valid	

Source: Processed primary data (2025)

Table 2 reports that the AVE values for each dimension are above 0.50. This confirms that all indicators have satisfied the convergent validity criteria [9]. Therefore, it can be concluded that convergent validity has been achieved.

Table 2 Average Variance Extracted (AVE) Value (Stage 1)

	Average Variance Extracted (AVE)
Improves Job Performance (JPR)	0.798
Increases Productivity (PRD)	0.729
Enhances Job Effectiveness (JEF)	0.820
Useful (USF)	0.825
Functional Risk (FUR)	0.831
Financial Risk (FIR)	0.793
Psychological Risk (PSR)	0.797
Time Risk (TIR)	0.782
User Satisfaction (ST)	0.777
User Loyalty (LY)	0.774

Source: Processed primary data (2025)

Discriminant Validity

Table 3 demonstrates that discriminant validity has been established, as indicated by the square root of the AVE for each construct (diagonal values) being greater than the correlations between constructs [9].

Table 3 Fornell-Larcker Criterion Results (Stage 1)

	FIR	FUR	JEF	JPR	LY	PRD	PSR	ST	TIR	USF
FIR	0.890									
FUR	0.712	0.912								
JEF	-0.667	-0.616	0.906							
JPR	-0.664	-0.654	0.776	0.894						
LY	-0.725	-0.595	0.711	0.718	0.879					
PRD	-0.646	-0.601	0.820	0.817	0.768	0.854				
PSR	0.708	0.715	-0.720	-0.710	-0.679	-0.692	0.893			
ST	-0.652	-0.651	0.745	0.836	0.779	0.804	0.725	0.881		
TIR	0.697	0.718	-0.679	-0.723	-0.634	-0.687	0.736	-0.713	0.884	
USF	-0.602	-0.599	0.705	0.751	0.686	0.763	-0.593	0.813	-0.639	0.908

Source: Processed primary data (2025)

Composite Reliability

Table 4 indicates that all composite reliability values exceed the threshold of 0.70, and the Cronbach's alpha values for each indicator also surpass 0.70. These results confirm that the research instruments employed in this study are reliable [9].

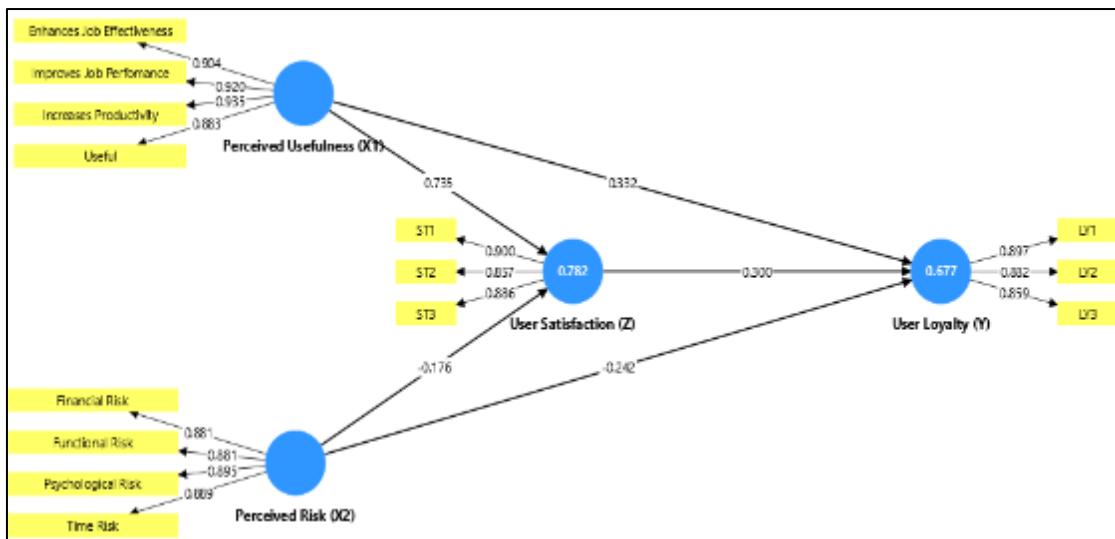
Table 4 Composite Reliability and Cronbach's Alpha (Stage 1)

	Cronbach's Alpha	Composite Reliability
Perceived Usefulness (PU)	0.931	0.951
Perceived Risk (PR)	0.909	0.936
User Satisfaction (ST)	0.856	0.913
User Loyalty (LY)	0.854	0.911

Source: Processed primary data (2025)

3.1.2. Second Stage of Embedded Two-Stage Approach

Following the completion of testing at the dimensional level, the subsequent step involves conducting testing at the variable level by utilizing the latent variable scores obtained from the first stage [9].

**Figure 4** Path Diagram of the Measurement Model (Stage 2)

Convergent Validity

Table 5 shows that each indicator within its respective dimension has a loading factor exceeding 0.70. This suggests that the latent constructs at the dimensional level are valid, as they are effectively reflected by their corresponding indicators [9].

Table 5 Outer Loadings Results Testing (Stage 2)

Indicator	Dimension	Variable	Loading Factor	Type (as defined)	Description
First Order					
ST1	Experience	User Satisfaction	0.900	Reflective	Valid
ST2	Expectation		0.857	Reflective	Valid
ST3	Needs		0.886	Reflective	Valid
LY1	Repeat Purchase	User Loyalty	0.897	Reflective	Valid
LY2	Retention		0.882	Reflective	Valid
LY3	Referrals		0.859	Reflective	Valid
Second Order					
JPR	Improves Job Performance	Perceived Usefulness	0.920	Reflective	Valid
PRD	Increases Productivity		0.935	Reflective	Valid
JEF	Enhances Job Effectiveness		0.904	Reflective	Valid
USF	Useful		0.883	Reflective	Valid
FUR	Functional Risk	Perceived Risk	0.881	Reflective	Valid
FIR	Financial Risk		0.881	Reflective	Valid
PSR	Psychological Risk		0.895	Reflective	Valid
TIR	Time Risk		0.889	Reflective	Valid

Source: Processed primary data (2025)

Table 6 reports that the AVE values for all dimensions exceed 0.50, indicating that each set of indicators has fulfilled the requirements for convergent validity. Accordingly, it can be concluded that convergent validity has been successfully established [9].

Table 6 Average Variance Extracted (AVE) Value (Stage 2)

	Average variance extracted (AVE)
Perceived Usefulness (PU)	0.829
Perceived Risk (PR)	0.786
User Satisfaction (ST)	0.777
User Loyalty (LY)	0.773

Source: Processed primary data (2025)

Discriminant Validity

Table 7 shows that discriminant validity is confirmed, as the square root of the AVE for each construct (represented by the diagonal values) is greater than the correlations among the constructs [9].

Table 7 Fornell-Larcker Criterion Results (Stage 2)

	ST	LY	PR	PU
ST	0.881			
LY	0.779	0.879		
PR	-0.774	-0.744	0.886	
PU	0.878	0.792	-0.813	0.911

Source: Processed primary data (2025)

Composite Reliability

Table 8 shows that all composite reliability values are above the 0.70 threshold, and the Cronbach's alpha values for each construct also exceed 0.70. These findings verify that the measurement instruments used in this study demonstrate strong reliability [9].

Table 8 Composite Reliability and Cronbach's Alpha (Stage 2)

	Cronbach's Alpha	Composite Reliability
Perceived Usefulness (PU)	0.931	0.951
Perceived Risk (PR)	0.909	0.936
User Satisfaction (ST)	0.856	0.913
User Loyalty (LY)	0.854	0.911

Source: Processed primary data (2025)

3.2. Evaluation of Structural Model (Inner Model)

Structural model testing, also known as inner model testing, is conducted to evaluate the predictive relationships among variables within the research model. This analysis involves assessing the coefficient of determination (R-Square) as a key indicator [9].

Table 9 R-Square Results

		R-Square
Perceived Usefulness ->	User Satisfaction	0.782
Perceived Risk ->		
Perceived Usefulness ->	User Loyalty	0.677
Perceived Risk ->		
User Satisfaction ->		

Source: Processed primary data (2025)

3.3. Hypothesis Test

The path coefficient results presented in Table 10 confirm that the perceived usefulness variable has a positive effect on customer satisfaction. This is supported by a path coefficient value of 0.735, a t-statistic of 9.736 which exceeds the critical value of 1.96, and a significance level of 0.000, which is below the 0.05 threshold [9]. These findings indicate that perceived usefulness has a positive and statistically significant influence on user satisfaction.

Table 10 Path Coefficient

	Path Coeff.	T Statistics	P Values	Conclusion
Perceived Usefulness -> User Satisfaction	0.735	9.736	0.000	H1 Accepted
Perceived Risk -> User Satisfaction	-0.176	2.227	0.013	H2 Accepted
Perceived Usefulness -> User Loyalty	0.332	2.218	0.013	H3 Accepted
Perceived Risk -> User Loyalty	-0.242	2.140	0.016	H4 Accepted
User Satisfaction -> User Loyalty	0.300	2.143	0.016	H5 Accepted
Perceived Usefulness -> User Satisfaction -> User Loyalty	0.220	2102	0.018	H6 Accepted
Perceived Risk -> User Satisfaction -> User Loyalty	-0.053	1348	0.089	H7 Rejected

Source: Processed primary data (2025)

Therefore, the first hypothesis, which states that perceived usefulness is presumed to have a positive and significant influence on user satisfaction, is accepted. In addition, hypotheses 3, 4, and 6 also show positive and significant effects. In contrast, hypotheses 2 and 5, which involve the perceived risk variable, reveal significant negative effects. Hypothesis 7, which examines the mediating role of user satisfaction in the relationship between perceived risk and user loyalty, is not supported due to the insignificance of the mediation pathway. Based on the results of both direct and indirect effect testing, it can be concluded that hypothesis 6 indicates a partial mediation effect, while hypothesis 7 shows no mediation effect.

4. Discussion

This research has succeeded in proving the first hypothesis because the research results show that the influence of perceived usefulness on user satisfaction has a significant positive effect. This means that the more benefits Flip users perceive when using the application, the more satisfied they tend to be. This finding aligns with previous studies [10, 11], which confirm that perceived usefulness significantly enhances satisfaction in digital service settings.

This research has succeeded in proving the second hypothesis because the research results show that the influence of perceived risk on user satisfaction has a significant negative effect. The analysis shows that users who perceive higher risk when using Flip tend to experience lower satisfaction. This result is supported by earlier findings [12,13], which demonstrate that perceived risk reduces satisfaction, particularly in online platforms.

This research has succeeded in proving the third hypothesis because the research results show that the influence of perceived usefulness on user loyalty has a significant positive effect. Users who find Flip beneficial are more likely to

continue using it in the future. This result is in line with prior research [14,17], which highlights the role of perceived usefulness in fostering loyalty across fintech services.

This research has succeeded in proving the fourth hypothesis because the research results show that the influence of perceived risk on user loyalty has a significant negative effect. When users perceive Flip as risky, their likelihood of remaining loyal decreases. This finding is consistent with previous studies [13,16], which report that perceived risk harms user loyalty in digital banking applications.

This research has succeeded in proving the fifth hypothesis because the research results show that the influence of user satisfaction on user loyalty has a significant positive effect. The results indicate that satisfied Flip users are more likely to continue using the application. These findings support earlier studies [16,17], which show that satisfaction plays a central role in building customer loyalty in digital contexts.

The results of the path coefficient test for the sixth hypothesis reveal the presence of two relationships, namely a direct effect between perceived usefulness and user loyalty, which is positive and significant, and an indirect effect from perceived usefulness to loyalty through user satisfaction, which is also positive. This suggests that when users perceive Flip as useful, it not only increases their satisfaction but also enhances their loyalty to the platform. The mediating relationship between perceived usefulness and loyalty through satisfaction is classified as partial mediation, meaning that satisfaction strengthens the relationship but the direct effect remains significant. These findings are in line with previous studies [10,11,18], which found that perceived usefulness significantly influences loyalty both directly and indirectly through satisfaction.

The results of the path coefficient test for the seventh hypothesis show that while perceived risk has a direct negative effect on user loyalty, the indirect effect through user satisfaction is not significant. This means that although higher perceived risk reduces satisfaction, it does not significantly influence loyalty through satisfaction. The mediating relationship between perceived risk and loyalty through satisfaction is therefore categorized as no mediation, since the indirect path does not meaningfully contribute to the overall relationship. This finding differs from earlier studies [12,19,20], which found that satisfaction mediated the negative influence of perceived risk on loyalty. However, the result aligns with more recent findings [16], which also reported no significant mediation in the context of e-commerce. In the case of Flip, this may suggest that perceived risks are already managed effectively, so they do not substantially weaken the link between satisfaction and loyalty.

5. Conclusion

- Perceived Usefulness has a positive and significant effect on User Satisfaction. This suggests that the more users find Flip useful, the more satisfied they feel using the application.
- Perceived Risk has a negative and significant effect on User Satisfaction. This indicates that the greater the risks perceived by users while using Flip, the lower their level of satisfaction.
- Perceived Usefulness also has a positive and significant impact on User Loyalty. This means that when users perceive clear benefits from Flip's features, they are more inclined to continue using the application.
- Perceived Risk negatively and significantly affects User Loyalty. In other words, a higher perception of risk discourages users from maintaining their loyalty to Flip.
- User Satisfaction has a positive and significant influence on User Loyalty. The more satisfied users are, the more likely they are to stay loyal to Flip over time.
- Perceived Usefulness (X1) significantly influences Loyalty (Y) through Satisfaction (Z) as a mediating variable, with a positive direction. This implies that perceived usefulness boost satisfaction, which then strengthens loyalty. This relationship is classified as Partial Mediation, since Perceived Usefulness still has a direct influence on Loyalty even without the mediating role of Satisfaction.
- On the other hand, Perceived Risk (X2) does not significantly influence Loyalty (Y) through Satisfaction (Z). This means Satisfaction does not mediate the relationship between Perceived Risk and Loyalty, and this relationship is classified as No Mediation.

Suggestions

- In the research results related to Perceived Usefulness variable, some item values still scored below average. For instance, Flip can improve service search features by adding filters such as service category, location, and pricing, and enhance recommendations during user input. In addition, information on available features should be enriched with brief guides and interactive content to support smoother user navigation.

- In the research results related to Perceived Risk variable, issues such as fear of disruptions and security concerns were still present. Flip can address this by reinforcing system stability, ensuring transparency in security measures, and adding real-time transaction alerts. Furthermore, feature reliability can be improved by conducting regular maintenance and allowing users to easily report bugs.
- In the research results related to User Satisfaction variable, a few item fell short of expectations, particularly related to how well Flip's services meet user needs. Flip can address this by launching quarterly satisfaction surveys and adjusting its services based on user feedback, as well as enabling request features for more personalized solutions.
- In the research results related to User Loyalty variable, some users were found to be affected by negative external opinions. To mitigate this, Flip should actively monitor user sentiment online, provide timely responses to concerns, and showcase positive user experiences. Loyalty programs or rewards for existing users can also help reinforce their engagement.
- Lastly, future research may consider expanding the study to different regions and incorporating additional variables such as brand trust or user engagement to gain deeper insights into the factors influencing loyalty in fintech applications.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that there are no conflicts of interest related to this study.

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