

# Shoppers' loyalty in online marketplace: The impact of interface quality, application incentives, and security/privacy through flow experience

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## Abstract

This study investigated the effects of Interface Quality, Application Incentives, and Security/Privacy on marketplace E-Loyalty through Flow experience. By prioritizing and improving these factors, marketplaces can foster a relational perspective that encourages users to develop a long-term relationship with the application, leading to sustained growth and success. Central to marketplace E-Loyalty is the relational perspective, which emphasizes consumers' intention to establish a relationship with a marketplace application without shifting to competitors. Respondents were selected purposively to participate in an online survey, resulting in 305 usable responses. A partial least square-structural equation modeling (PLS-SEM) was employed to establish the measurement and structural fit of the data. The results confirmed that Interface Quality and Flow directly influenced E-Loyalty, while Interface Quality and Security/Privacy indirectly influenced Flow. Application Incentives were not found to bolster E-Loyalty directly and indirectly through Flow experience. This study provides a broader view of the importance of Interface Quality and Security/Privacy in promoting E-Loyalty with Flow while also offering a new perspective on the effect of Application Incentives on marketplace E-Loyalty from a relational standpoint.

**Keywords:** Application incentives; e-loyalty; flow; interface quality; security and privacy.

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## INTRODUCTION

For the past few years, the evolution of the Internet and the trend of online shopping has been meteoric. In 2021, 69.4% of global internet users aged 16-64 years did mobile shopping. The emerging online shopping trend also happened in developing countries, including Indonesia, where 78.2% of Indonesian internet users aged 16-64 years have done mobile shopping. In 2020 Indonesian Internet Service Providers Association stated that the COVID-19 pandemic substantiated this trend, mainly seen in the larger volume of transactions in the online marketplace and has become one of the primary reasons Indonesians shop online.

Consequently, marketplace service providers compete for customer loyalty, emphasizing consumers' intentions to maintain relationships with related marketplaces without switching to competitors (Oliver, 1999; Toufaily et al., 2013). Furthermore, due to consumers not being present during online shopping activities (G. Sharma & Lijuan, 2014), digital stimuli, such as Interface Quality, Application Incentives, or Security/Privacy, may affect consumers' emotional responses (Jamshidi et al., 2018). Such stimuli have been confirmed to be important reasons why Indonesian consumers prefer one marketplace over the others (Statista, 2021).

The physical absence of consumers during the process of online shopping (Al-dweeri et al., 2019; Sharma & Lijuan, 2014; Trivedi & Yadav, 2018) also causes marketplace application Interface Quality to play a significant role not only as a communication tool, but especially in improving consumer relationship, intention, and loyalty towards that marketplace (Bilgihan et al., 2014; Chang & Chen, 2008; Fan et al., 2013). The interface design can also boost the success of an e-commerce platform (H. Sharma & Aggarwal, 2019). Digital transaction uncertainty may also affect consumer behavior (Shehzadi et al., 2016) due to the requirement to provide personal information during online transactions (Rita et al., 2019). Therefore, examining the effect of user data security and privacy on loyalty in the marketplace is deemed essential. In the current situation, marketplace service providers also provide exclusive offerings via applications to attract consumers to shop at related marketplace applications continuously. A previous study has shown that consumers tend to be more interested in advertising messages offering financial benefits (Y. J. Kim & Han, 2014). However, there is certainty about the effect of Application Incentives on E-Loyalty. Although several studies have found the significant impact of Application Incentives on E-Loyalty (Chiu & Cho, 2019; Khare et al., 2019; Young Kim & Kim, 2004), others did not. For example, Audrain-Pontevia et al. (2013) study did not confirm that such incentives (e.g., transaction values) have a significant direct effect on satisfaction or loyalty. Therefore, this study also aims to investigate the role of Application Incentives in consumer E-Loyalty from a relational perspective.

Csikszentmihalyi & Csikszentmihalyi (1988) stated that the Flow experience occurs when consumers are engrossed in their task. This thinking follows Oliver's (1997, 1999) relational theory that deserves more application in information systems and online consumer behavior studies. It is specifically essential considering the extensive body of literature focusing only on the transactional aspects of human-website/application interaction, thus neglecting the potential impact of its relational aspects, and concentrating on a deeper level of attachment or commitment. This research tries to fill this gap by investigating the flow experience Csikszentmihalyi (1975) in online shopping because consumers often need to be aware that they shop online to forget their daily. However, to the researcher's best knowledge, studies that investigate the concept of Flow in marketplace applications are rare. Furthermore, from a relational perspective and in the context of marketplace application, the mediating role of Flow in the relationship between Application Incentives and Security/Privacy to E-Loyalty has also been rarely explored.

This study enriches the existing literature on the effects of Interface Quality, Application Incentives, and Security/Privacy on E-Loyalty and the mediating role of Flow in these relationships, especially in the context of frequently used marketplace applications by online consumers. In addition, it also serves as a reference for marketplace service providers to improve application users' E-Loyalty and prevent them from moving to competitors.

## **HYPOTHESES DEVELOPMENT**

### **Flow Theory**

Flow theory is based on a quantitative study conducted by Csikszentmihalyi (1975), where study participants spent several hours on several activities. Participants in the survey stated that they acted spontaneously and seemed to be carried away by the current. This condition is then called flow (Drengner et al., 2018). Csikszentmihalyi & Csikszentmihalyi (1988) stated that flow conditions occur

when consumers are dissolved in the activity. Csikszentmihalyi (1990) describes flow as a highly desired particular condition so that the person hopes to experience it again as often as possible. According to Kim & Han (2014), flow is defined as a condition of individual dissolution in a particular activity when the individual concerned acts with full involvement (Smith & Chen, 2018). This definition also aligns with the flow definition in other studies (Zhang et al., 2014). Other studies define flow as an enjoyable absorption of certain activities where the individual is unaware of the time that has passed (Fan et al., 2013). By experiencing flow conditions, individuals become involved in the stimulus received (O'Casey & Carlson, 2010).

### **S-O-R Framework**

The Stimulus-Organism-Response (S-O-R) framework was first developed by Mehrabian and Russell (1974), which is defined as a process in which external factors from the environment (stimulus) affect the individual's internal conditions (organism), causing the individual to avoid or approach the external stimulus (response) (Yadav & Rahman, 2018). For example, upon visiting a digital platform, consumers can feel digital stimuli through various aspects, such as information, entertainment, visualization, and personalization. In addition, it can also come from marketing programs on related platforms (Chopdar & Balakrishnan, 2020; Hsu et al., 2012; Liu et al., 2019). This study categorizes digital stimuli into Interface Quality, Application Incentives, and Security/Privacy, with Flow as the organismal stage (Herrando et al., 2018; Hsu et al., 2012; Zhang et al., 2014) as they are considered external factors experienced and faced by consumers when shopping online at marketplace applications. E-Loyalty was selected as a response since E-Loyalty is one of the marketplace's success factor determinants (H. Sharma & Aggarwal, 2019).

### **Interface Quality, Application Incentives, and Security/Privacy**

Interface Quality is an external stimulus faced by the consumer. Several studies use the term website quality to describe the website or application interface (Ali, 2016; Fan et al., 2013; Hsu et al., 2012; Paek et al., 2020; Sharma & Aggarwal, 2019; Tsai, 2017), while others used e-commerce quality (Tzavlopoulos et al., 2019), characteristics of mobile shopping platforms (Liu et al., 2019), attributes of online shopping/mobile commerce/e-shopping malls (Jayawardhena & Wright, 2009; Oh et al., 2012; Wang & Li, 2012; Young Kim & Kim, 2004), or website design (Rita et al., 2019). However, there has yet to be a consensus on the dimensions measuring Interface Quality (Fan et al., 2013). Furthermore, (Chang & Chen, 2008, 2009) also stated that including all customer interface features in a single study is unlikely. Therefore, this study follows Fan et al. (2013) and Paek et al. (2020) by treating Interface Quality as the environmental atmosphere a consumer comes into contact with when using or shopping within a marketplace application. It considers five aspects, namely: (1) convenience, the degree to which the consumer feels that it is easy to navigate the marketplace application (i.e., the marketplace application is user-friendly), (2) contents, the extent to which a marketplace application provides useful, valuable, and various information on products and services, (3) aesthetics, the overall image or pleasurable atmosphere that the e-commerce site projects via its application to consumers through the use of inputs (fonts, graphics, colors, and background patterns), (4) interactivity, the degree to which marketplace application facilitates two-way communication with its users, (5) personalization, the ability of a marketplace application to tailor products, services, and the transactional environment to individual customers.

In the offline shopping context, the promotions and discounts presented by the seller may appeal to consumers through the value offered (Khare et al., 2019). On the other hand, in the online shopping context, marketplace service providers show promotions and discounts via Application Incentives. Application Incentives are exclusive offerings and discounts given by retailers (or, in this case, marketplace service providers) to entice consumers to download or make a purchase (Chopdar &

Balakrishnan, 2020; Liu et al., 2019). Based on a prior study, consumers prefer tangible benefits and pay greater attention to advertisement messages that offer financial incentives (Y. J. Kim & Han, 2014), from which they derive added value when making a transaction.

At some point, when consumers finalize their online shopping process, they would need to submit personal information, such as addresses, phone numbers, names, and sometimes credit card numbers. Given the occasional requirement to submit personal information before making an online purchase, as well as the fact that consumers do not physically interact with the seller, consumers also consider and pay careful attention to the application security and user data protection (Al-dweeri et al., 2019; Rita et al., 2019; Trivedi & Yadav, 2018). The previous study defined security as users' protection from fraud and financial loss (Bressolles et al., 2007). In addition, in the context of e-commerce, security and privacy may apply to the computer, credit card, financial information, or personal information transmission security (Ahmad et al., 2016; Ali, 2016; Chang & Chen, 2009; Oh et al., 2012; Rita et al., 2019).

From a relational perspective, consumers assess the cost and benefit of maintaining or terminating their relationship with a company and compare it to alternative companies (Chang & Chen, 2009). Therefore, a proper website interface reflects the company's willingness to invest in maintaining consumer relationships, which leads to effective consumer responses (Chang & Chen, 2009). The consumers would also revisit an attractive website, facilitate the quick transaction (Abou-Shouk & Khalifa, 2017; Chang & Chen, 2009), personalized (Wang & Li, 2012), filled with helpful information (Tsai, 2017), and interactive (Yadav & Rahman, 2018). In addition, consumers who perceive website providers as ethical regarding the security and protection of personal data can become loyal (Lu et al., 2013). Consequently, they will not make repeat purchases when experiencing the negative consequences of online shopping (Chiu et al., 2014).

Consumers also revisit and make repeated purchases given specific incentives (Young Kim & Kim, 2004). Exclusive offerings of a mobile commerce application provide the consumers' perceived cost and time-saving, eventually influencing their repurchase decision (Chopdar & Balakrishnan, 2020). However, (Audrain-Pontevia et al., 2013) found that transaction value (e.g., good deals) does not affect loyalty to goal-directed shopping activities.

This study adds to the extant literature by examining the effects of Interface Quality, Application Incentives, and Security/Privacy on E-Loyalty. We, therefore, hypothesize that:

H1. Interface Quality influences E-Loyalty.

H2. Application Incentives influence E-Loyalty.

H3. Security/Privacy influences E-Loyalty.

The environment within which digital stimuli prevail may affect consumers' emotional responses (Chang & Chen, 2009) and induce Flow experience and specific behaviors (Jamshidi et al., 2018). Several authors (Ali, 2016; Bao & Huang, 2018; Fan et al., 2013; Hsu et al., 2012; Oh et al., 2012; Paek et al., 2020; Soni, 2021) confirmed the effect of Interface Quality (or website quality, web-store image, e-shopping mall attribute) on consumers' Flow experience. Consumers may experience a state of Flow (subconscious immersion and engrossment) when they feel safe with the digital platform (Morales-Solana et al., 2019). However, consumers will not experience Flow with dubious online vendors. Marketing activities such as events, membership points, or coupons may also influence consumers' Flow experience through satisfaction (Oh et al., 2012). Coupons, in particular, evoke consumers' curiosity about acquiring and using the incentives, thus becoming more focused and enjoying the shopping experience (Kim & Han, 2014). However, previous studies confirmed that price did not induce tourism package Flow (M. Kim & Thapa, 2017). Neither did it affect users' sense of pleasure browsing on a mobile shopping platform (Liu et al., 2019). Based on the above mentioned, this study examines broader determinants of Flow experience, Interface Quality, Application Incentives, and Security/Privacy in Flow. We, therefore, hypothesize that:

- H4. Interface Quality influences Flow.
- H5. Application Incentives influence Flow.
- H6. Security/Privacy influences Flow.

### **Flow**

Csikszentmihalyi & Csikszentmihalyi (1988) states that Flow occurs when the consumers are engrossed in their tasks (Paek et al., 2020, p. 3), an enjoyable experience highly anticipated as often as possible (Smith & Chen, 2018, p. 147). Several authors (Kim & Han, 2014; O'Cass & Carlson, 2010; Smith & Chen, 2018) have argued that Flow occurs when individuals fully engage. Flow is stated to influence consumer behavior toward websites and companies (Hsu et al., 2012), including, customers loyalty (Bilgihan, 2016; Fan et al., 2013; Hsu et al., 2013; Morales-Solana et al., 2019; Soni, 2021), marketplace service loyalty (Drengner et al., 2018), social networking site loyalty (Zhou et al., 2010), mobile banking loyalty (Jamshidi et al., 2018) and branded application loyalty (Smith & Chen, 2018). Flow increases website stickiness (Bao & Huang, 2018; Smith & Chen, 2018) by evoking positive consumer emotions. It also causes consumers to want to explore the website further (O'Cass & Carlson, 2010) and strengthens their desire to experience the same thing again (Herrando et al., 2018; Zhang et al., 2021). Hence, the consumer's intention to use the same service in the future increases with Flow (Bilgihan et al., 2014; Jamshidi et al., 2018).

Several studies confirmed that Flow-mediated the effect of website quality on Chinese and Korean consumer intention to maintain a relationship with the website (Fan et al., 2013), interface design and personalization on omnichannel shopping intention (Ameen et al., 2020), and website quality on customer satisfaction (Paek et al., 2020), but not in the relationship between price value and destination loyalty (Kim & Thapa, 2017).

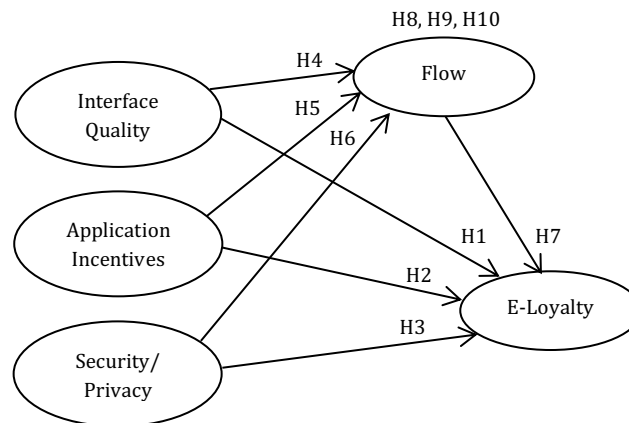
This study defines Flow as a pleasurable experience that individual gains when they concentrate, engages, and engrosses in a particular activity such that they lose consciousness of time (Drengner et al., 2018; Fan et al., 2013; Kim & Han, 2014; Paek et al., 2020; Smith & Chen, 2018). Therefore, we formulate the following hypotheses:

- H7. Flow influences E-Loyalty.
- H8. Flow mediates the relationship between Interface Quality and E-Loyalty.
- H9. Flow mediates the relationship between Application Incentives and E-Loyalty.
- H10. Flow mediates the relationship between Security/Privacy and E-Loyalty.

### **E-Loyalty**

Consumers may switch from one online shop to another in the digital era (Chou et al., 2015). Some researchers often discuss E-Loyalty in terms of electronic word-of-mouth and repurchase or continuance intention (Chang & Chen, 2008; Hsu et al., 2013; Lee et al., 2014; Abou-Shouk & Khalifa, 2017; Herrando et al., 2018; Tsai, 2017; Drengner et al., 2018; Thakur, 2018; Sharma & Aggarwal, 2019; Chopdar & Balakrishnan, 2020). However, the discussion is somewhat unbalanced when viewing E-Loyalty from a relational perspective, emphasizing consumers' commitment to a given brand and unwillingness to use the competing ones (Wang & Li, 2012; Bilgihan, 2016; Yadav & Rahman, 2018; Quan et al., 2020; Tran et al., 2020). (Oliver, 1999) defined E-Loyalty in relational terms, which views online loyalty as a force that prevents customers from switching to another brand, although there is an excellent reason to change. Later, (Toufaily et al., 2013) developed the definition of online customer loyalty as a customer's intention to maintain a relationship, revisit and repurchase a product/service in the future, using the company's website as the main channel among a variety of alternatives, based on their beliefs and positive emotions toward the company, irrespective of situational influences and marketing efforts to sway the customer into shifting to other brands. Therefore, this study defines E-Loyalty as a customer's intention to preserve a relationship as well as to revisit or repurchase in the

future through a (same) marketplace application as the main option among a variety of alternatives (Fan et al., 2013; Quan et al., 2020; Toufaily et al., 2013). The conceptual framework of this research is presented in Figure 1.



**Figure 1**  
**Research framework**

## METHOD

The measurement for all latent variables was contextualized to marketplace application (MA). First, the measure of Interface Quality was adapted from (Fan et al., 2013) and (Paek et al., 2020), using five indicators: convenience, contents, aesthetics, interactivity, and personalization, each of which contains three items. Next, application Incentives were measured using three indicators from Chopdar & Balakrishnan (2020). Next, there were eight items measuring Security/Privacy, adapted from Ahmad et al. (2016), Ali (2016), Chang & Chen (2009), Oh et al. (2012), and Rita et al. (2019). Next, the flow was measured based on Drengner et al. (2018), Fan et al. (2013), Kim & Han (2014), and Paek et al. (2020), with a total of eight items. Finally, the measurement of E-Loyalty was adapted from Fan et al. (2013), Quan et al. (2020), and Toufaily et al. (2013), and consisting of five items. In total, there are 38 items in the questionnaire. All statements were answered using the Likert Scale on a scale from 1 (strongly disagree) to 5 (strongly agree).

Overall, the questionnaire consists of three parts. The first part contains an introduction, a respondent data confidentiality statement, and the first screening question. A general demographic question and another screening question were located in the second part. Before disseminating the research sample, two academics, who were also practitioners in relevant fields, reviewed the items in the questionnaire. In addition, a pilot study was also conducted on a few respondents. We modified the questions and statements in the final questionnaire based on the review.

An online questionnaire was disseminated through the Google Forms web survey platform. The context of this research was the Shopee application, which ranked first for the iPrice website visits and application downloads in 2021 and topped the ranks of international marketplaces in Indonesia in 2021 (Statista, 2021). We screened the respondents based on typical Shopee users who were mostly 18 to 48 years old from Snapcart Global in 2018 and had used the application at least once in the last three months. After a purification analysis, the survey returned 342 responses and arrived at a final 305 observations (89.2%) that were qualified for data analysis. Table 1 shows the demographic profile of the respondents.

## RESULTS AND DISCUSSION

### Result

We employed a Partial Least Squares-Structural Equation Modelling (SEM PLS) following the recommended two-step approach (Hair et al., 2017) to assess the measurement and structural fit of the research model. In the first stage, we evaluated and confirmed the reliability and validity of the measurement model. In the second stage, we performed a structural model assessment to test the hypotheses, including determining the PLS model's predictive accuracy (through the coefficient of determination,  $R^2$ ) and its predictive relevance ( $Q^2$ ).

**Table 1**  
**Demographic Profile**

Category	Number	Percentage
1. Sex		
Male	91	29.8%
Female	214	70.2%
2. Age range		
18–28 years old	238	78.0%
29–38 years old	42	13.8%
38–49 years old	25	8.2%
3. Occupation		
Employee	137	44.9%
Entrepreneur	39	12.8%
Student	111	36.4%
Professional (doctor, teacher, etc.)	8	2.6%
Others	10	3.3%
4. Income range (per month)		
Less than Rp1,000,000	43	14.1%
Rp1,000,000–Rp5,000,000	66	21.6%
Rp5,000,000–Rp10,000,000	110	36.1%
Over Rp10,000,000	86	28.2%
5. Domicile		
Sumatera	7	2.3%
Jawa	246	80.7%
Kalimantan	31	10.2%
Bali and Nusa Tenggara	12	3.9%
Others	9	3.0%
6. Frequency of using the Shopee application within the last 3 months		
Once in 3 months	24	7.9%
Twice in 3 months	27	8.9%
1–2 times in 1 month	84	27.5%
3–4 times in 1 month	73	23.9%
Over 4 times in 1 month	97	31.8%
	<b>Total</b>	<b>305</b>
		<b>100.0%</b>

Source: Data processed (2021)

The convergent validity assessment at the item level showed that several measurements (FL2, CV1, CN3, IN3, and PER2) did not pass the recommended threshold level of minimum 0.4 outer loadings (Hair et al., 2017), which thus were removed from the model. As a result, the Average Variance Extracted (AVE) values for all constructs passed the recommended cut-off value of 0.5. The Composite Reliability (CR) values were also satisfactory, as they lay between the cut-off value of 0.6 – 0.9. Table 2 shows the response tendency, composite reliability (CR), and AVE of each final indicator and variable.

The discriminant validity assessment concluded that both the Fornell-Lacker Criterion and the Heterotrait-Monotrait Ratio were met (as shown in Table 3 and Table 4). There was no multicollinearity issue in the data, as shown by the Variance Inflation Factor (VIF) value smaller than five (Hair et al., 2017).

**Table 2**  
**Measurement Tendency and Fit**

<b>Latent and observed variables</b>	<b>Item Code</b>	<b>Mean</b>	<b>SD</b>	<b>Outer Loading</b>	<b>CR</b>	<b>AVE</b>
<b>Interface Quality</b>						
MA is convenient for me to do the shopping without assistance.	CV2	4.08	0.85	0.641	0.920	0.512
MA provides a direction on how to use each service.	CV3	4.42	0.79	0.733		
MA is easy to use.	CN1	3.91	0.86	0.657		
MA provides useful content.	CN2	3.70	0.91	0.644		
MA provides valuable content.	AES1	3.76	1.09	0.769		
MA provides varied content.	AES2	4.11	0.94	0.824		
The appearance of the MA's design is attractive.	AES3	4.21	0.91	0.846		
Using MA is pleasurable.	IN1	4.27	0.89	0.718		
I feel comfortable while using MA.	IN2	4.05	0.93	0.700		
MA has a search feature that makes it easy to find a product.	PER1	4.02	0.84	0.646		
It is easy for me to compare one product against another on the MA.	PER3	3.36	1.02	0.659		
<b>Application Incentives</b>						
MA offers membership benefits.	API1	3.88	0.88	0.869	0.846	0.649
MA gives shopping vouchers to its users.	API2	4.38	0.76	0.832		
MA offers cashbacks to its users.	API3	4.17	0.88	0.707		
<b>Security/Privacy</b>						
MA has an adequate security feature.	SEC1	4.00	0.80	0.798	0.951	0.710
I feel it safe to make a transaction on MA.	SEC2	4.24	0.74	0.796		
MA safeguards my credit card/debit card/digital wallet information.	SEC3	4.01	0.84	0.849		
MA has privacy policies related to user personal data.	SEC4	4.02	0.87	0.842		
MA keeps user personal data secure.	SEC5	3.96	0.88	0.898		
I feel it safe to share sensitive personal information (e.g., ID card photo, selfie) via MA.	SEC6	3.67	1.03	0.818		
I believe that MA keeps my personal information secure.	SEC7	3.85	0.93	0.902		



Latent and observed variables	Item Code	Mean	SD	Outer Loading	CR	AVE
I believe that MA will not misuse my personal data.	SEC8	3.83	0.95	0.829		
<b>Flow</b>						
I am engrossed in the shopping activity on MA.	FL1	3.44	1.23	0.740	0.914	0.603
I am fully conscious when doing the shopping on MA.	FL3	3.37	1.21	0.756		
I can temporarily forget my daily routine when doing the shopping on MA.	FL4	3.64	0.99	0.642		
I concentrate fully when doing the shopping application on MA.	FL5	3.39	1.25	0.806		
When I am doing the shopping in MA, it feels as if time flies by.	FL6	4.03	0.86	0.820		
Overall, I enjoy my shopping activity in MA.	FL7	3.78	0.94	0.803		
I want to feel again the feelings I felt when using MA in the future.	FL8	4.01	0.88	0.852		
<b>E-Loyalty</b>						
I like my shopping activity in MA.	LOY1	3.70	1.05	0.886	0.961	0.830
I will remain on this MA to do the shopping rather than going to other marketplace applications.	LOY2	3.75	1.15	0.920		
To do online shopping, MA is my priority over other marketplace applications.	LOY3	3.52	1.19	0.926		
Although there are other marketplace applications comparable to this MA, I prefer doing the shopping on this MA.	LOY4	3.47	1.17	0.897		
I will do the shopping on this MA although other marketplace applications offer products with the same benefits.	LOY5	3.62	1.13	0.926		

Source: Data processed (2021)

**Table 3**  
**Fornell-Lacker Criterion**

Variable	Application Incentives	Flow	Interface Quality	Security/Privacy	E-Loyalty
Application Incentives	0.806				
Flow	0.403	0.777			
Interface Quality	0.476	0.631	0.716		
Security/Privacy	0.455	0.500	0.545	0.842	
E-Loyalty	0.400	0.644	0.692	0.473	0.911

Source: Data processed (2021)

R<sup>2</sup> and Q<sup>2</sup> evaluations, as seen in Table 5, were conducted to see the strength and relevance of the independent variables in predicting the dependent variables. Based on these values, Interface Quality, Application Incentives, and Security/Privacy could predict Flow at 43.8% strength, with 24.8%

relevance. Meanwhile, Interface Quality, Application Incentives, Security/Privacy, and Flow were able to predict E-Loyalty at 55.4% strength, with 45.4% relevance.

**Table 4**  
**Heterotrait-Monotrait Ratio**

Variable	Application Incentives	Flow	Interface Quality	Security/Privacy	E-Loyalty
Application Incentives					
Flow	0.445				
Interface Quality	0.543	0.674			
Security/Privacy	0.514	0.527	0.593		
E-Loyalty	0.428	0.681	0.733	0.500	

Source: Data processed (2021)

**Table 5**  
**Coefficient of Determination and Predictive Relevance**

Dependent Variable	R <sup>2</sup>	Q <sup>2</sup>
Flow	0.438	0.248
E-Loyalty	0.554	0.454

Source: Data processed (2021)

Based on the hypotheses testing results presented in Table 6, Interface Quality ( $\beta = 0.440$ ;  $t_{\text{value}} = 7.172$ ;  $p_{\text{value}} = 0.000$ ) and Flow ( $\beta = 0.325$ ;  $t_{\text{value}} = 5.540$ ;  $p_{\text{value}} = 0.000$ ) had significant positive effects on E-Loyalty. According to the results, H1 and H7 were accepted. Application Incentives ( $\beta = 0.035$ ;  $t_{\text{value}} = 0.709$ ;  $p_{\text{value}} = 0.478$ ) and Security/Privacy ( $\beta = 0.055$ ;  $t_{\text{value}} = 1.004$ ;  $p_{\text{value}} = 0.315$ ) were found to have positive effects, albeit insignificant, on E-Loyalty. Therefore, H2 and H3 were rejected. Flow was also found to be positively and significantly influenced by Interface Quality ( $\beta = 0.483$ ;  $t_{\text{value}} = 8.248$ ;  $p_{\text{value}} = 0.000$ ) and Security/Privacy ( $\beta = 0.200$ ;  $t_{\text{value}} = 3.320$ ;  $p_{\text{value}} = 0.001$ ), but not by Application Incentives ( $\beta = 0.082$ ;  $t_{\text{value}} = 1.655$ ;  $p_{\text{value}} = 0.098$ ). Therefore, H4 and H6 were accepted, while H5 was rejected.

**Table 6**  
**Structural Path Coefficients Significance Test Results**

Direct effects	Path Coefficient	$t_{\text{value}}$	$p_{\text{value}}$
H1. Interface Quality $\rightarrow$ E-Loyalty	0.440*	7.172*	0.000
H2. Application Incentives $\rightarrow$ E-Loyalty	0.035	0.709	0.478
H3. Security/Privacy $\rightarrow$ E-Loyalty	0.055	1.004	0.315
H4. Interface Quality $\rightarrow$ Flow	0.483*	8.248*	0.000
H5. Application Incentives $\rightarrow$ Flow	0.082	1.655	0.098
H6. Security/Privacy $\rightarrow$ Flow	0.200*	3.320*	0.001
H7. Flow $\rightarrow$ E-Loyalty	0.325*	5.540*	0.000

Note: \* $p < 0.05$

Source: Data processed (2021)

Based on the result stated in Table 7, it was discovered that Flow significantly mediates the relationships of Interface Quality on E-Loyalty ( $\beta = 0.157$ ;  $t_{\text{value}} = 4.411$ ;  $p_{\text{value}} = 0.000$ ) and Security/Privacy on E-Loyalty ( $\beta = 0.065$ ;  $t_{\text{value}} = 2.734$ ;  $p_{\text{value}} = 0.006$ ). However, the mediating role of Flow was found to be insignificant in the relationship between Application Incentives and E-Loyalty ( $\beta = 0.027$ ;  $t_{\text{value}} = 1.518$ ;  $p_{\text{value}} = 0.129$ ). Therefore, H8 and H10 were accepted, while H9 was rejected.

This study also determined the mediation strength of Flow based on the Variance Accounted For (VAF) values. Table 7 shows that Flow partially mediated the relationship between Interface Quality and E-Loyalty. Specifically, 26.53% of the effect of Interface Quality on E-Loyalty was explained by Flow. In addition, Flow also partially mediated the relationship between Security/Privacy and E-Loyalty, showing that Flow explained 54.17% of the effect of Security/Privacy on E-Loyalty.

**Table 7**  
**Statistical Test (Bootstrapping) Results for Mediated Relationships**

Indirect effects		Path Coefficient	$t_{value}$	$p_{value}$	VAF	Results
H8.	Interface Quality → Flow → E-Loyalty	0.157*	4.411*	0.000	26.30%	Partial Mediation
H9.	Application Incentives → Flow → E-Loyalty	0.027	1.518	0.129	N/A	No Mediation
H10.	Security/Privacy → Flow → E-Loyalty	0.065*	2.734*	0.006	54.17%	Partial Mediation

Note: \* $p < 0.05$

Source: Data processed (2021)

## Discussion

Based on the findings of this study, Interface Quality significantly influences Flow and E-Loyalty. Furthermore, interface Quality was also a digital stimulus with the strongest effect on Flow and E-Loyalty (as seen on the path coefficient). In other words, the atmospheric quality of the marketplace application was able to drive the consumers to concentrate, engage and engross their shopping activities on the application, amplifying the consumers' intention to use the marketplace application without switching to competitors. This research's finding is in line with previous studies (Ali, 2016; Fan et al., 2013; Hsu et al., 2012; Oh et al., 2012; Paek et al., 2020; Soni, 2021). Consumers only attend virtually during online shopping settings, so a marketplace application relies on the interface to communicate with consumers (Bilgihan et al., 2014). Therefore, the role of Interface Quality in online contexts plays the same role as shop atmosphere and design in offline contexts (Hsu et al., 2012). Furthermore, the interaction with the marketplace application's interface and interactivity can affect consumers' emotional response to the application (Jamshidi et al., 2018). Thus, making them enjoy, concentrate on making purchases, and gain greater pleasure, leading to a state of Flow (Bao & Huang, 2018).

This study confirms the previous research that Interface Quality was able to directly encourage the development of consumer E-Loyalty towards a certain marketplace platform (Chang & Chen, 2008, 2009; Fan et al., 2013; Jayawardhena & Wright, 2009; Lionello et al., 2020; Sharma & Aggarwal, 2019; Tsai, 2017; Tzavlopoulos et al., 2019; Wang & Li, 2012). The platform's good interface and digital display (visuality) create a perception that service providers are willing to maintain their relationship with consumers, resulting in consumers' affective responses (Chang & Chen, 2009). A good interface can also encourage consumers to revisit related applications (Abou-Shouk & Khalifa, 2017). With a good interface, users will feel comfortable exploring the application, enhancing the positive consumer perspective on the quality of the marketplace application itself. Furthermore, the attractive appearance, valuable content, and interactivity of a website also give sensory pleasure and enhance virtual warmth perception to the visitors, which also sways the visitors to revisit the website (Tsai, 2017).

This study also found that Flow was directly influenced by the marketplace application's user data security and privacy. This finding adds to previous research concerning the rarely studied role of personal information security and protection in Flow (Ali, 2016; Morales-Solana et al., 2019; Zhou et al., 2010). This study proves that marketplace application users must first feel safe with the application to

enter the Flow state. It is due to the uncertainties in an online environment involving financial transactions and personal information submitted. Therefore, when application users distrust the security of the marketplace application, they will be wary (cautious) and will not truly immerse in the shopping activities in the marketplace application, preventing them from experiencing Flow.

Meanwhile, the hypotheses' significance testing showed that Security/Privacy did not directly affect E-Loyalty. This finding diverges from previous studies, which state that perceived risk, privacy, and security concern could influence repurchase intention or WOM (Chiu et al., 2014; Har Lee et al., 2011; (Trivedi & Yadav, 2020). Consumer data security and protection could increase consumers' intention to repurchase. However, they could not prevent them from switching to other competitors. The possible reason is that user personal data security and protection are mandatory for any marketplace application. Every marketplace application in Indonesia has a sufficient user data security and protection system. As a result, the Security/Privacy system does not serve as an added value between one marketplace and another. Hence did not prevent users from switching to other competitors.

Application Incentives were also found to not influence E-Loyalty, both directly and indirectly through Flow. These results differ from the research by Young Kim & Kim (2004), Kim & Han (2014), and Oh et al. (2012), but they bear similarities with those studies by Khare et al. (2019), M. Kim & Thapa (2017), and Liu et al. (2019). Incentives may affect Flow as consumers seek to find out how to gain and use existing incentives (Kim & Han, 2014). However, in Indonesian marketplace applications, Application Incentives are already at hand for use, sparing the consumers from the need to look for a way to gain incentives, causing them to have incentives in mind only when they are about to complete a transaction. Application Incentives are also transactional, so they will only be used for customer retention in the short term and new customer activation. Promotional activities are also said to be unable to evoke positive emotions in mobile shopping platform users (Liu et al., 2019) because all online shopping platforms employ the same promotional technique. Therefore, promotional activity (Application Incentives) does not give consumers pleasure. Neither does it cause the consumer to choose one marketplace application over another.

Furthermore, membership cards in offline contexts (at shopping centers) are often only associated with social status (Khare et al., 2019), which is presumed to be the case with marketplace platforms in Indonesia. Transaction value (e.g., application offerings) was discovered to have no direct effect on E-Loyalty if the shopping activity is goal-directed (Audrain-Pontevia et al., 2013). During the pandemic, most application users conduct shopping activities online to meet their everyday needs, which they no longer can do offline. For this reason, they tend to overlook incentives as long as their demands are fulfilled.

E-Loyalty was also found to be significantly influenced by Flow. The experience and positive emotions resulting from Flow make consumers willing to explore and interact with a website (Aboubaker Ettis, 2017; Bao & Huang, 2018; O'Cass & Carlson, 2010; Smith & Chen, 2018), improve consumer association with a brand (Bilgihan et al., 2014), and strengthen consumer intention to have such experience again in the future (Herrando et al., 2018; Zhang et al., 2021).

The flow was found to mediate the relationship between Interface Quality and Security/Privacy to E-Loyalty, suggesting that market security and privacy systems can encourage consumers to select certain market applications only when consumers experience flow. It could happen because flow can help consumers navigate smoothly and lower the perception of online transaction uncertainty and insecurity (Ameen et al., 2020). Ultimately, this results in an increased positive consumer experience during app usage. Moreover, this study confirms previous research, stating that flow mediates the relationship between website quality and relationship intentions (Fan, Yul Lee, and in Kim, 2013) and website design on patronage intentions (Zhang et al., 2021).

## CONCLUSION

This study explains the role of Interface Quality, Application Incentives, and Security/Privacy in strengthening E-Loyalty from a relational perspective. It also contributes to the literature on the mediating role of Flow which is rarely investigated in marketplace applications. Marketplace e-loyalty is rarely described from a relational perspective because consumers can easily switch from one marketplace to another. However, as already mentioned, this study can provide a compelling standpoint on the factors influencing marketplace e-loyalty from a relational perspective. Several factors encourage consumers to stay in a certain marketplace without switching to other marketplaces, such as Interface Quality and Security/Privacy, especially when consumers experience Flow. Although the context of this study is restrained to one marketplace application brand, the research model is extendable to other marketplace brands, both in Indonesia and overseas.

Interface Quality directly determines whether or not consumers are loyal to shop and stay as long as possible in a certain marketplace application. Therefore, marketplace service providers should first pay attention to the overall appearance of the application regarding the aesthetic elements, such as fonts, texts, colors, pictures, multimedia, and other components. All of these must be arranged to allow the users to feel comfortable using the application. In addition, other interface features should be considered, such as convenience, content, two-way communication, and personalized recommendations.

For the marketplace service provider, it is essential to upgrade the user's information security system and nurture consumer trust in the security system, especially concerning sensitive personal information (e.g., identity cards). Whereas for the vendors who hold store brands and possibly product brands within a marketplace ecosystem, personal information must remain confidential at all costs and will only be used for personalization purposes such as product or cross-buying recommendations, potential items that match user needs, etc.

This research advances the literature on information systems and consumer behavior since it investigates the effects of both transactional and, more specifically, relational aspects of human-machine interaction on customer flow and loyalty within a marketplace environment. We highlight the specific application of the relational perspective (the psychological attachment resulting from customer-application interaction) and its proven empirical results, highlighting the importance of considering more emotional or psychological aspects when predicting and controlling how consumers behave in a marketplace environment.

Sample size becomes one of this study's limitations. Therefore, future studies are encouraged to use a larger sample size collected from various regions in Indonesia. In addition, theoretical and managerial perspectives suggest the future inclusion of other important determinants of Flow and E-Loyalty, such as customer satisfaction or marketplace credibility. Furthermore, other variables related to e-retailers (e.g., response time, customer satisfaction, quality of communication, brand reputation, personalization, resolution rate) may also be studied in the context of marketplace applications, as consumers often communicate with those e-retailers during online transactions in a marketplace. Finally, Flow may also become an engaging, immersive experience that must be studied in related contexts such as digital banking or specific e-commerce categories (e.g., health-related or beauty-related) whose products require thoughtful consideration (high involvement products).

### Author Contribution:

- Felicia Angela Adrianto: mapping of reputable journal articles, designing a research framework, hypotheses, & questionnaire, analyzing data, and writing the article.

- Oviliani Yenty Yuliana: designing a rese collecting data arch framework, hypotheses, & questionnaire, analyzing data, and writing, editing, and revising the article
- Ferry Jaolis: analyzing data and editing the article.

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