The Impact of Interface Quality and Security/Privacy on Shoppers' E-Loyalty: The Mediating Role of Flow

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***Abstract*—In the era of digitalization and the development of mobile applications, consumers can shop anywhere and anytime easily through the marketplace application. As many marketplaces develop, particularly in Indonesia, this study determines the role of digital stimuli, namely: Interface Quality and Security/Privacy, on consumer loyalty to marketplaces, as well as the mediating role of Flow in these relationships. Data collection using the purposive sampling method for marketplace application users in Indonesia and as many as 305 respondents were analyzed by the Higher-Order Model using the SmartPLS 3.3.3. This study found that Interface Quality affects E-Loyalty, either directly or through Flow. In addition, the Security/Privacy of the marketplace application also affects E-Loyalty through Flow.**

Keywords-flow; e-loyalty; interface quality; security and privacy; e-commerce

I. INTRODUCTION

In the era of digitalization and the development of mobile applications, consumers can easily do shopping activities anytime and anywhere. This activity was driven by the launch of e-commerce (marketplace) applications and websites. Consumers only need to download e-commerce applications or use certain e-commerce websites to do shopping activities. In Indonesia, users of e-commerce platforms are increasing every year. In 2020, there were 138 million e-commerce platforms users in Indonesia, with online shopping at least once a week [1]. A large e-commerce market in Indonesia encourages marketplace platforms to develop. A marketplace is a location where sales and purchases of products occur, where sellers and buyers meet digitally [2]. Consumers can switch shopping from one marketplace to competitor's marketplaces easily. The ease of moving is one of the considerations for marketplace service providers to be able to keep consumers using the marketplace application. Therefore, the concept of e-loyalty from a relational perspective becomes essential for further study. Online customer loyalty from a relational perspective is described as a consumer's intention to make repeated transactions or relationships with the same company compared to other alternatives [3].

Based on a survey conducted in Indonesia, several factors make consumers choose a marketplace platform for shopping. Among the eleven main reasons a consumer uses a marketplace platform, three relate to the interface quality and security of the relevant marketplace platform [1]. Good interface quality is stated to increase relationship intention and consumer loyalty on marketplace platforms [4–6], which can increase e-commerce success [7]. In addition, consumer loyalty can also grow in marketplace service providers that provide security features and personal data protection [8]. Therefore, these two factors are interesting to study, mainly because their role in e-loyalty from a relational perspective has not been explored before.

Consumers often shop online to forget about their daily activities [9]. Flow is the condition when the consumer is dissolved in the activity that is being done so that he fails the routine that is being carried out [10]. The concept of Flow has been studied in a marketing context and has influenced consumer loyalty [5, 10–12]. However, not many studies discuss the mediating role of Flow in the context of using marketplace applications.

Therefore, this study uses the Stimulus-Organism-Response (S-O-R) framework to determine the effect of interface quality and security/privacy on e-loyalty from a relational perspective and the mediating role of Flow in this relationship. In addition, this study also determines the influence of Flow in encouraging consumer loyalty for marketplace applications. With this aim, this study contributes to factors that can promote e-loyalty from a relational perspective and can be a reference material for marketplace service providers to develop features and systems to encourage online consumer loyalty.

II. LITERATURE REVIEW

A. Interface Quality (Stimulus)

The interface Quality of a digital platform can be a stimulus to the S-O-R framework because of its similar role to the physical environment of an offline store [13]. Interface Quality is a concept that measures consumer perceptions of transaction quality from before the purchase to after the purchase is made [6]. However, it is impossible to examine all components in one study because it will be exhaustive [4]. Therefore, this study adopts the Interface Quality dimension carried out in study [4, 6], which is then supplemented by [4–6]. Based on this study, Interface Quality describes the atmosphere of the marketplace application felt by consumers when shopping at the

marketplace application related to the dimensions listed in Table I.

TABLE I. FIVE DIMENSION OF INTERFACE QUALITY

Dimension	Definition
Convenience	The degree of consumers feels that navigation on a website is easy.
Contents	The degree of an e-commerce website provides useful, valuable, and diverse product and service information.
Aesthetics	The overall place or pleasant atmosphere that an e-commerce website projects to its consumers through several elements (fonts, graphics, colors, and background patterns).
Interactivity	The ability of an e-commerce website to facilitate two-way communication with its users.
Personalization	The ability of the website to customize products, services and transaction environments based on individual customers.

Several previous studies found the effect of Interface Quality (also known as website quality, e-commerce service quality, and so on) on E-Loyalty [4–7, 14, 15]. Furthermore, consumer interactions with the atmosphere of digital platforms can affect consumer behavior and emotional responses [16]. In addition, the good features and appearance of a website also give consumers the perception that the related website is willing to invest in maintaining relationships with consumers, which in turn encourages consumers' affective responses [6]. Based on this, this study establishes the following hypothesis.

H1a. Interface Quality affects E-Loyalty

B. Security/Privacy (Stimulus)

Transactions carried out digitally have risks and uncertainties where consumers are required to enter personal data and information to carry out transactions [17]. Consequently, there is a risk of misuse of personal data, which in the end might become a financial risk [18]. In addition, consumers may not be able to visit shops or meet the sellers physically [19], [20]. Therefore, a security system and personal data protection can influence consumer decisions to choose specific marketplace platforms. Thus, the security/privacy of the marketplace application covers the entire transaction security system, including the security of users' personal information. System security and privacy can otherwise affect the E-Loyalty of online consumers. Consumers will not make repeat purchases if they have experienced adverse consequences on the related digital platform [21]. Consumers tend to use the same website if the site has a high-security system [6]. Based on this, this study establishes the research hypothesis as follows.

H1b. Security/Privacy affects E-Loyalty.

C. Flow (Organism)

In 1988, Csikszentmihalyi stated that the flow condition occurs when consumers are dissolved in the activity [10]. The individual also acts with full involvement in this condition and is often unaware of the elapsed time [5, 22]. Flow is defined as an individual's desired condition and expectation to experience the same situation as often as possible [22]. Flow is also defined as a condition in which an individual is immersed in an activity carried out when the individual acts with full involvement [22]. Another study describes Flow as a pleasurable experience (enjoyable absorption) of specific activities in which the individual is unaware of the elapsed time [5].

Some studies also found that Interface Quality can encourage consumers to experience Flow when shopping online [5, 10, 12, 23–26]. The atmosphere of an excellent digital platform (e.g., website) can generate positive emotions for site visitors [6]. Online shopping platforms rely on interfaces to communicate their products and services [27]. Therefore, website quality significantly influenced Flow [5, 20]. In addition, consumers can only be immersed in their shopping activities if they feel that the marketplace application or related digital platform is a safe application or platform [11]. When consumers have concerns about Security and Privacy, consumers will become more vigilant. Therefore, it will reduce consumer control and enjoyment [28]. Based on this, this study formulates the following hypotheses.

H2a. Interface Quality affects Flow

H2b. Security/Privacy affects Flow.

Flow is stated to positively affect loyalty [11, 12, 27, 29]. The consumer Flow experience encourages consumers to revisit the same site because of the desire to experience the same feeling again [30–32]. Flow also increases the stickiness and attractiveness of a website [22]. Flow also has a mediating role in several studies [5, 10, 33]. By experiencing Flow, the perception of insecurity and uncertainty experienced by consumers decreases so that consumers' intentions to visit smart malls also increase [33]. Based on this, this study establishes the following hypotheses.

H3. Flow affects E-Loyalty.

H4a. Flow mediates the relationship between Interface Quality and E-Loyalty.

H4b. Flow mediates the relationship between Security/Privacy and E-Loyalty.

D. E-Loyalty (Response)

Online consumer loyalty (E-Loyalty) can be one of the benchmarks for the success of e-commerce platforms, including marketplace applications. Using E-commerce platforms, consumers easily compare similar products in various online stores [34], making it easier for consumers to move from one marketplace to another. With this condition, e-loyalty from a relational perspective is essential to study in marketplace applications, namely: the concept of loyalty where consumers do not switch to other alternatives even though there are good reasons to switch [35]. Based on a relational perspective, e-loyalty is defined as maintaining customer relationships to buy products/services repeatedly in the future using the same company's website as the primary choice. As a result, customers are not affected by situational and competitors' marketing efforts made to influence consumers [3].

Based on the literature, this study establishes the research framework according to Fig. 1.

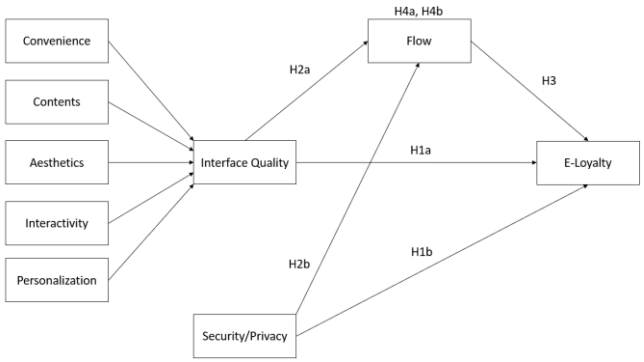

Figure 1. Research Framework

III. METHODS

The questionnaire consists of three parts. The first part is about the introduction, confidentiality statement, and screening. In addition, the second part contains general questions and the second screening. The third part contains question items for each latent variable. Measurements for latent variables were adopted from previous studies and adapted to the context of the marketplace application to be studied. The statements (questionnaire items) in the third part are answered using a Likert scale of 1 (strongly disagree) to 5 (strongly agree). Before the online questionnaire was distributed, two academics and practitioners in related fields reviewed the questionnaire statement items.

The questionnaires were then distributed using a purposive sampling technique through a web survey platform with respondents from Shopee application users aged 18-48 years who had used the application at least once in the last three months. The selection of the Shopee application context was based on 2020 data which states that the Shopee application was the application with the highest user rating in Indonesia [1]. We obtained 342 answers. After further screening and 305 data could be used for quantitative analysis Higher-Order Model using SmartPLS 3.3.3.

The demographics of the respondents are described as follows. Respondents were dominated by women 70.2%, while male respondents were 29.8%. From the age category, most respondents were aged 18-28 years (78.0%), followed by respondents aged 29-38 years (13.8%) and 38-49 years (8.2%). From the occupational category, the most respondents were workers (44.9%), followed by students (36.4%) and others (18.7%). Furthermore, from the category of income range per month, most of the respondents' income was Rp.5,000,000.00–Rp.10,000,000.00 (36.1%), the second-highest income was Over Rp.10,000,000.00 (28.2%), followed by the income range of Rp.1,000,000.00–Rp5,000,000.00 (21.6%), and income Less than Rp1,000,000.00 (14.1%). In addition, from the domicile category, most respondents came from Java island (80.7%) and the rest from other islands as much as 19.3%. From frequency using the Shopee category, the highest percentage transaction more than four times a month was 31.8%, the second-highest percentage transaction twice a month was 27.5%, followed by transaction three to four times a month was 23.9%, and the transaction once or twice in the last three months was 16.8%.

IV. RESULTS

A. Measurement Model Assessment

In the first stage, evaluation is carried out on the measurement model to assess the reliability and validity of the indicators used to measure each variable. Convergent validity evaluation is done by evaluating the outer loading and AVE values. The FL2 indicator is reduced because it has an outer loading value smaller than 0.4 [36]. Indicators CN3, IN3, and PER2 were also eliminated because they produced an AVE value lower than 0.5 [36]. The composite reliability value of each variable was more significant than 0.6 [36]. In addition, the measurement model has met the Fornell-Lacker and Heterotrait-Monotrait ratio criteria as shown in Table II dan Table III respectively. There is no multicollinearity in this measurement model, which can be seen with the Variance Inflation Factor value, which is smaller than 5 [36].

TABLE II. FORNELL-LACKER CRITERION

	E-Loyalty	**Flow**	**Interface Quality**	**Security/ Privacy**
E-Loyalty	0.911			
Flow	0.644	0.777		
Interface Quality	0.686	0.633	0.707	
Security/Privacy	0.473	0.500	0.550	0.842

TABLE III. HETEROTRAIT-MONOTRAIT RATIO

	E-Loyalty	**Flow**	**Interface Quality**	**Security/ Privacy**
E-Loyalty				
Flow	0.681			
Interface Quality	0.729	0.679		
Security/Privacy	0.500	0.527	0.597	

B. Structural Model Assessment

We evaluated R^2 and Q^2 to assess the strength and relevance of the independent variables in predicting the dependent variable. Interface Quality and Security/Privacy can predict Flow by 43.4% with a relevance of 24.6%. Interface Quality, Security/Privacy, and Flow can predict E-Loyalty by 54.7%, with relevance of 44.9%.

Based on the results of hypothesis testing, Interface Quality (β = 0,439; t_{value} = 7,129; p_{value} = 0,000) has a positive and significant effect on E-Loyalty, but not with Security/Privacy (β = 0,064; t_{value} = 1,206; p_{value} = 0,228). In addition, Interface Quality (β = 0,513; t_{value} = 9,728; p_{value} = 0,000) and Security/Privacy (β = 0,218; t_{value} = 3,666; p_{value} = 0,000) were found to have a positive and significant effect on Flow. Flow was also found to have a positive and significant effect on E-Loyalty (β = 0,334; t_{value} = 5,667; p_{value} = 0,000). Thus, H1a, H2a, H2b, dan H3 are accepted, while H1b is rejected.

This study also determines the significance of Flow's mediating role. Based on the results of hypothesis testing, Flow was found to have a significant mediating role in the relationship between Interface Quality and E-Loyalty (β = 0,171; t_{value} = 4,687; p_{value} = 0,000) and the relationship between Security/Privacy and E-Loyalty (β = 0,073; t_{value} = 2,906; p_{value} = 0,004). Thus, H4a and H4b are accepted.

V. Discussion

This study found that E-Loyalty is influenced by Interface Quality, either directly or indirectly through the mediating role of Flow. Interface Quality shows the important role of Convenience, Contents, Interactivity, Personalization, and Aesthetics features in encouraging consumers to choose a marketplace application without switching to another marketplace application. In addition, the Interface Quality of the marketplace application can be a differentiating value that makes consumers always choose to use the marketplace application. This study is in line with previous studies [4–7, 15, 37, 38]. The mediating role of Flow found in the relationship between Interface Quality and E-Loyalty proves that Flow can increase the positive experience experienced by consumers when interacting with the application interface, which in turn becomes the added value of the application. In addition, Flow can provide a perception of smooth navigation for consumers [33], which shows this research is in line with previous studies [5, 32].

Security/Privacy did not have a direct effect on E-Loyalty. However, Security/Privacy could indirectly affect E-Loyalty through the mediating role of Flow. The existence of consumer Flow experience can be a value-added that distinguishes the security system and personal data protection of a marketplace application from other marketplace applications, making consumers choose the marketplace application. In addition, Flow also helps reduce consumer perceptions of the uncertainty and security of marketplace applications [33].

In addition, this study also succeeded in finding that Flow is directly affected by Interface Quality and Security/Privacy. Marketplace applications rely on interfaces to communicate with consumers [27]. Therefore, a good interface becomes good communication with consumers, which encourages consumers to be immersed in their shopping activities. In addition, this study also adds to the previous literature on the role of security and privacy on Flow [11, 24, 39]. Finally, this study proves that consumers must first feel safe with the related marketplace application, then they can experience Flow (dissolved with shopping activities in the application).

The Flow was found to directly influence the consumer E-Loyalty of the marketplace application. When shopping activities in the marketplace application absorb the consumer, the consumer will return to using the related application without switching to competitors. This research is in line with previous studies which state that positive experiences and emotions gained by experiencing Flow make consumers want to interact and explore the platform further [22, 26, 31, 40], which in turn encourages consumers to want to experience the experience again in the future [30, 32].

VI. Conclusion

Based on the findings of this study, marketplace service providers can develop Interface Quality features, especially in terms of convenience, contents, aesthetics, interactivity, and personalization. In addition, marketplace service providers must continuously improve and develop personal data security and protection systems. These two features and systems must primarily be designed in such a way as to encourage consumers to experience Flow while on the move in the related marketplace application, which in turn makes these consumers always choose the marketplace compared to other alternatives.

Future studies can add other variables that can affect E-Loyalty from a relational perspective, such as promotional programs and variables related to e-retailers. For example, marketplace service providers often provide promotional and incentive programs to attract consumers' attention. In addition, consumers are also often in contact with e-retailers who are members of the relevant marketplace.

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