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The Role of User Experience and Product Information Quality on Consumer Satisfaction and Customer Loyalty in Marketplace Platforms with Trust as a Moderating Variable

Hulwatul Adzro[1], Fitri Aditri[1], Taufik Hudha Nursyafaah[1], Regina Aulia Ramadhani[1], Neni Alyani[1,2], M Miftahul Madya[1]

[1]Lembaga Riset AI Creation (LRAC), Depok, Indonesia
[2]Institut Pemerintahan Dalam Negeri, Sumedang, Indonesia

*corresponding author: mmiftahulm29@gmail.com

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Abstract:
This study aims to analyze the influence of user experience and product information quality on consumer satisfaction and customer loyalty, with consumer trust as a moderating variable. A quantitative approach was employed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with data collected from 100 marketplace users through a 5-point Likert scale questionnaire. The results indicate that several indicators do not meet the required validity and reliability thresholds, as reflected in low outer loading, AVE, and reliability values. Although multicollinearity was not detected, the measurement model has not yet achieved adequate quality. These findings suggest that the relationships among variables cannot be interpreted optimally. Therefore, improvements in measurement instruments are necessary to obtain more robust and reliable results in future research.

Abstrak:
Penelitian ini bertujuan untuk menganalisis pengaruh pengalaman pengguna dan kualitas informasi produk terhadap kepuasan konsumen dan loyalitas pelanggan dengan kepercayaan sebagai variabel moderasi. Penelitian menggunakan pendekatan kuantitatif dengan metode Partial Least Squares–Structural Equation Modeling (PLS-SEM) terhadap 100 responden melalui kuesioner skala Likert 1–5. Hasil penelitian menunjukkan bahwa beberapa indikator belum memenuhi kriteria validitas dan reliabilitas, yang ditunjukkan oleh nilai outer loading, AVE, dan reliabilitas yang rendah. Meskipun tidak ditemukan masalah multikolinearitas, model pengukuran belum memiliki kualitas yang memadai. Oleh karena itu, hubungan antar variabel belum dapat diinterpretasikan secara optimal. Penelitian selanjutnya perlu memperbaiki instrumen pengukuran agar menghasilkan temuan yang lebih akurat dan reliabel.

1. INTRODUCTION

The expansion of digital technology has significantly transformed the landscape of electronic commerce, particularly through the emergence of marketplace platforms. These platforms not only enable online transactions but also shape the overall shopping experience encountered by users. In this regard, user experience (UX) plays a vital role in influencing how consumers perceive the ease, comfort, and effectiveness of interacting with a marketplace system. Alongside this, the quality of product information becomes equally important, as it provides consumers with the necessary details to evaluate products and make informed purchasing decisions. High-quality information—characterized by clarity, completeness, and accuracy—can help minimize uncertainty and enhance consumer confidence in online transactions [1].

Consumer satisfaction is widely recognized as a crucial determinant of long-term success in online marketplaces. It reflects the extent to which the actual shopping experience aligns with or surpasses consumers' prior expectations. A positive level of satisfaction is often associated with stronger customer loyalty, which is demonstrated through repeated purchases and continued use of the same platform. However, in the context of online transactions where risks and uncertainties are prevalent, trust emerges as a key factor. Trust can influence how consumers interpret their experiences and evaluate the reliability of both the platform and the sellers, thereby affecting the relationship between user experience, information quality, satisfaction, and loyalty [2].

A number of prior studies have examined complex relationships among variables using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach, which is widely recognized for its ability to analyze latent constructs in predictive and exploratory research designs [3]. In the context of e-commerce, trust and perceived security have been identified as essential factors influencing consumer behavior and online transaction reliability [4]. Empirical evidence shows that SEM-PLS has been effectively applied across various domains, including education, technology adoption, and organizational behavior. For instance, research in vocational education demonstrates that digital technology adoption is influenced by factors such as communication, ease of use, and perceived effectiveness, highlighting the relevance of hybrid learning models in sustaining digital practices [5]. Similarly, studies in the field of chemometrics reveal that perception and knowledge significantly contribute to analytical competence, emphasizing the importance of integrating data-driven skills in modern education [6]. In addition, method

validation is a crucial process to ensure the reliability and accuracy of chemical analysis, where conceptual understanding of validation objectives, parameters such as accuracy and precision, and chemometric principles significantly influence its proper implementation [7]. In a broader social context, SEM-PLS has also been used to explain how sustainable leadership, cultural intelligence, and social adaptation collectively shape tolerance within multicultural communities [8]. Furthermore, SEM-PLS applications in organizational and digital contexts indicate that multiple factors interact to influence behavioral outcomes. For example, internship program quality and mentor support have been found to significantly enhance work readiness, with technological tools strengthening these relationships [9]. In the e-commerce domain, promotion and social influence affect online purchasing decisions both directly and indirectly through convenience as a mediating factor [10]. Likewise, service awareness and management quality contribute to user engagement, particularly in increasing library visit frequency through the mediation of user interest [11]. Other studies highlight that work environment and motivation influence competence, which in turn affects work readiness, reinforcing the importance of mediating variables in structural models [12]. In the context of digital transformation, SEM-PLS findings further indicate that technology readiness plays a significant role in the adoption of generative artificial intelligence (AI), which subsequently enhances organizational performance [13]. Additionally, digital capability has been shown to influence innovation capability and operational efficiency, although some indicators still require improvement in terms of validity and reliability [14]. Research also suggests that perceived ease of use contributes to the adoption of generative AI, which can strengthen the competitive advantage of digital startups [15]. Recent research shows that the implementation of simple technology, such as Orange Data Mining, improves accessibility in chemometric analysis but does not automatically enhance the quality of spectral signal analysis without sufficient user data literacy [16]. Another study indicates that although spectral preprocessing using the Savitzky–Golay method demonstrates consistent performance, limitations in measurement indicators of technology implementation and data literacy affect the evaluation of analytical accuracy [17]. Furthermore, evidence suggests that simple technology implementation can improve statistical understanding, yet its impact on more complex analytical tasks such as outlier detection remains limited, emphasizing the importance of strengthening user competencies [18]. Overall,

these findings confirm that SEM-PLS is a robust analytical tool for examining complex relationships, including the roles of mediating and moderating variables in influencing satisfaction and loyalty outcomes.

Although SEM-PLS has been widely utilized to examine relationships across various fields, several research gaps can still be identified. Previous studies tend to emphasize direct effects or mediation mechanisms, such as the roles of convenience, competence, or user interest, while the moderating role of trust has received relatively less attention, particularly in the context of marketplace platforms. In addition, earlier research has explored technology adoption, digital capability, and user behavior in different settings; however, comprehensive studies that integrate user experience and product information quality as key determinants of both consumer satisfaction and customer loyalty remain limited. Furthermore, empirical evidence within the Indonesian marketplace context is still insufficient, especially in explaining how trust may strengthen or weaken the relationships among these variables. Therefore, this study aims to examine the effects of user experience and product information quality on consumer satisfaction and customer loyalty, as well as to analyze the role of trust as a moderating variable in strengthening these relationships within marketplace platforms.

2. METHOD

This research adopts a quantitative design and applies the *Partial Least Squares–Structural Equation Modeling* (PLS-SEM) technique to examine the relationships among latent constructs. The selection of PLS-SEM is based on its flexibility in handling complex models and its suitability for predictive analysis, particularly when working with relatively limited sample sizes [19]. The study investigates five key variables, namely user experience (UX), product information quality, consumer trust, consumer satisfaction, and customer loyalty within the scope of marketplace usage.

The data were obtained through a survey administered to 100 individuals who have prior experience using marketplace platforms. Responses were measured using a five-point Likert scale, ranging from strong disagreement to strong agreement. This scaling method is commonly employed to capture respondents' perceptions and evaluations in a structured quantitative format [20]. The detailed indicators for each construct are not elaborated in this section, as they are systematically presented in a dedicated table to enhance clarity and readability.

Table 1 Variable, Definition, and Indicator

Variable	Type	Code	Indicator

User Experience (UX)	Independent	UX1	Ease of navigation
		UX2	Ease of finding products
		UX3	Ease of transaction process
Product Information Quality (INFO)	Independent	INFO1	Completeness of product information
		INFO2	Clarity of product description
		INFO3	Accuracy of product information
		INFO4	Relevance of product details
Consumer Trust (TRUST)	Moderating	TRUST 1	Trust in marketplace platform
		TRUST 2	Trust in sellers
		TRUST 3	Reliability of information
Consumer Satisfaction (SAT)	Dependent	SAT1	Satisfaction with shopping experience
		SAT2	Experience meets expectations
		SAT3	Overall satisfaction level
Customer Loyalty (LOY)	Dependent	LOY1	Intention to repurchase
		LOY2	Preference for the same platform
		LOY3	Willingness to recommend

The analysis procedure involves two main stages within the PLS-SEM framework, namely the assessment of the measurement model (*outer model*) and the structural model (*inner model*). The measurement model is evaluated to ensure the adequacy of validity and reliability using criteria such as outer loading, *Variance Inflation Factor* (VIF), *Average Variance Extracted* (AVE), Cronbach's Alpha, and composite reliability (rho c). Outer loading values indicate the strength of each indicator, while AVE reflects the level of convergent validity. Reliability is assessed through Cronbach's Alpha and composite reliability, whereas VIF is used to identify potential multicollinearity issues among indicators [19], [21].

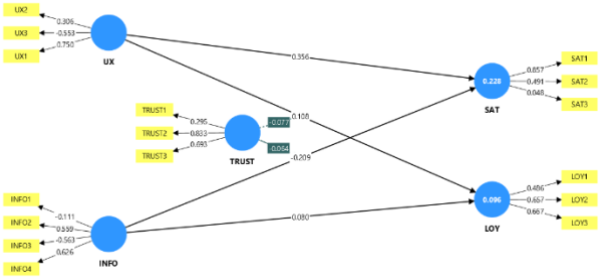

Fig. 1 Model Diagram and Intervariable Relationship

Furthermore, the *inner model* analysis is conducted to examine the relationships among latent variables, including both direct effects and the role of moderating variables in the research model. In this study, consumer trust acts as a moderating variable that is tested in strengthening the relationships between user experience and product information quality toward consumer satisfaction and customer loyalty. The results are interpreted based on path coefficients, significance levels, and the strength of relationships among variables to address the research objectives [19], [21].

3. RESULT AND DISCUSSION

The evaluation of the measurement model (*outer model*) reveals several important findings regarding the validity and reliability of the constructs used in this study. Based on the outer loading values, only a few indicators meet the recommended threshold of 0.70, such as UX1 (0.750), TRUST2 (0.833), and SAT1 (0.857), indicating that these indicators are strong representations of their respective constructs. However, a considerable number of indicators exhibit low or even negative loading values, such as UX3 (-0.553), INFO3 (-0.563), and INFO1 (-0.111), suggesting weak or invalid measurement items. According to measurement model criteria, outer loading values below 0.70 indicate that the indicators may not adequately represent the latent variables and should be reconsidered or removed from the model [22]. This finding implies that the measurement instruments used in this study still require refinement to improve construct validity.

Furthermore, the convergent validity assessed through the Average Variance Extracted (AVE) shows that all constructs have AVE values below the recommended threshold of 0.50, namely UX (0.321), INFO (0.258), TRUST (0.420), SAT (0.326), and LOY (0.371). These results indicate that the constructs fail to explain more than half of the variance of their indicators, reflecting inadequate convergent validity [19]. In terms of reliability, Cronbach's Alpha and composite reliability (rho c) values are also relatively low across most constructs, with some values even approaching zero or negative (e.g., INFO = -0.091; SAT = -0.096). This condition indicates poor internal consistency among indicators, which may be caused by inconsistent responses or poorly designed measurement items [23]. Therefore, both validity and reliability results suggest that the current measurement model does not yet meet the recommended standards for SEM-PLS analysis.

On the other hand, the multicollinearity test using the Variance Inflation Factor (VIF) shows that all indicator values are below the critical threshold of 5.00, with values ranging approximately between 1.000 and 1.091. This indicates that there is no significant multicollinearity issue among the indicators, meaning that each indicator contributes independently to the construct without excessive overlap [21]. From this perspective, the model satisfies one of the important assumptions in SEM-PLS, even though other aspects such as validity and reliability still require improvement.

Relating these findings to the theoretical framework presented in the introduction, the weak validity and reliability results suggest that the relationships between user experience,

product information quality, trust, satisfaction, and loyalty cannot yet be interpreted optimally. Previous studies have consistently shown that user experience and information quality significantly influence satisfaction and loyalty, particularly when supported by strong trust in the platform [24], [25]. However, in this study, the inadequate measurement quality limits the ability to confirm these relationships empirically. The moderating role of trust, which is theoretically expected to strengthen the relationship between independent and dependent variables, also cannot be fully validated due to the insufficient quality of the measurement model.

These findings highlight a critical gap between theoretical expectations and empirical results. While prior research emphasizes the importance of well-validated constructs in ensuring accurate model estimation, this study demonstrates that insufficient measurement quality can lead to inconclusive or weak findings [22]. Therefore, future research should focus on improving the quality of measurement instruments, such as refining indicator wording, increasing the number of valid items, and conducting pilot testing before full data collection. By enhancing measurement quality, subsequent studies are expected to produce more robust results and provide stronger empirical support for the role of user experience, information quality, and trust in shaping consumer satisfaction and customer loyalty in marketplace platforms.

Construct & Indicator	Loading Factor	AVE	Cronbach's Alpha	rho_c	VIF
UX		0.321	0.041	0.111	
UX1	0.750				1.003
UX2	0.306				1.000
UX3	-0.553				1.003
INFO		0.258	-0.091	0.081	
INFO1	-0.111				1.043
INFO2	0.559				1.046
INFO3	-0.563				1.006
INFO4	0.626				1.027
TRUST		0.420	0.393	0.656	
TRUST1	0.295				1.067
TRUST2	0.833				1.091
TRUST3	0.693				1.039
SAT		0.326	-0.096	0.491	
SAT1	0.857				1.009
SAT2	0.491				1.000
SAT3	0.048				1.009
LOY		0.371	0.141	0.634	
LOY1	0.486				1.004
LOY2	0.657				1.014
LOY3	0.667				1.017
TRUST x INFO	1.000				1.000
TRUST x UX	1.000				1.000

Construct & Indicator	Description
UX	**Not Valid and not reliable**
UX1	Valid
UX2	Not valid
UX3	Not valid
INFO	**Not Valid and not reliable**
INFO1	Not valid
INFO2	Valid
INFO3	Not valid
INFO4	Valid
TRUST	**Not Valid and not reliable**
TRUST1	Not valid
TRUST2	Valid
TRUST3	Valid
SAT	**Not Valid and not reliable**
SAT1	Valid
SAT2	Not valid
SAT3	Not valid
LOY	**Not Valid and not reliable**
LOY1	Not valid
LOY2	Valid
LOY3	Valid

4. CONCLUSION

This study aimed to examine the relationships between user experience, product information quality, consumer trust, consumer satisfaction, and customer loyalty using the SEM-PLS approach. The findings indicate that the measurement model has not yet met the required standards of validity and reliability, as reflected in low outer loading values, AVE, and reliability coefficients across several constructs. Although no multicollinearity issues were detected, the overall quality of the measurement model limits the ability to draw strong conclusions regarding the relationships among variables. These results suggest that improvements in measurement instruments are necessary to obtain more accurate and reliable findings. Future research is recommended to refine the indicators, enhance construct validity, and ensure better data quality in order to provide stronger empirical evidence on the role of user experience, information quality, and trust in influencing consumer satisfaction and customer loyalty in marketplace platforms.

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