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The Influence of Digital Promotion and Competitive Pricing on Purchase Intention and Impulsive Buying in Marketplaces with Digital Literacy as a Moderating Variable

Regina Aulia Ramadhani[1], Taufik Hudha Nursyafaah[1], Muhammad Rizky[1], Hulwatul Adzro[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 examines the influence of digital promotion and competitive pricing on online purchase intention and impulsive buying behavior in e-commerce marketplaces, with digital literacy as a moderating variable. The increasing development of digital commerce has changed consumer behavior, making promotional strategies and pricing competition important determinants in online purchasing decisions. The objective of this research is to analyze the direct effects of digital promotion and competitive pricing on purchase intention and impulsive buying, as well as the moderating role of digital literacy. A quantitative approach was applied using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with 100 respondents collected through a Likert scale questionnaire. The results of the measurement model indicate that several indicators have low validity and reliability, although the structural relationships remain theoretically relevant. The findings suggest that digital promotion and competitive pricing influence consumer behavior, while digital literacy strengthens or weakens these effects. The study concludes that construct refinement is necessary for stronger model accuracy.

Abstrak:
Penelitian ini mengkaji pengaruh promosi digital dan harga kompetitif terhadap niat beli online dan perilaku pembelian impulsif pada marketplace, dengan literasi digital sebagai variabel moderasi. Perkembangan perdagangan digital yang pesat telah mengubah perilaku konsumen, sehingga strategi promosi dan persaingan harga menjadi faktor penting dalam keputusan pembelian online. Tujuan penelitian ini adalah untuk menganalisis pengaruh langsung promosi digital dan harga kompetitif terhadap niat beli dan pembelian impulsif, serta peran moderasi literasi digital. Pendekatan kuantitatif digunakan dengan Structural Equation Modeling–Partial Least Squares (SEM-PLS) terhadap 100 responden menggunakan kuesioner skala Likert. Hasil pengujian model pengukuran menunjukkan bahwa beberapa indikator memiliki validitas dan reliabilitas yang rendah, meskipun hubungan struktural secara teoritis tetap relevan. Temuan menunjukkan bahwa promosi digital dan harga kompetitif memengaruhi perilaku konsumen, sedangkan literasi digital dapat memperkuat atau memperlemah pengaruh tersebut. Penelitian ini

menyimpulkan bahwa diperlukan penyempurnaan konstruk untuk meningkatkan akurasi model.

1. INTRODUCTION

The development of digital technology has significantly transformed consumer behavior, particularly in online shopping activities through marketplaces. This transformation is characterized by the increasing use of e-commerce platforms that offer ease of access, product variety, and various digital-based marketing strategies. Digital promotions such as discounts, cashback, and vouchers have become key factors in attracting consumer attention amid increasingly intense competition. In addition, competitive pricing is an important consideration for consumers in making purchasing decisions, as they tend to compare prices across platforms before completing transactions [1], [2].

In the context of online consumer behavior, purchase intention and impulsive buying are two important aspects influenced by both external and internal factors. Digital promotions can quickly enhance consumer interest, while competitive pricing strengthens consumers' perceived value. On the other hand, impulsive buying often occurs due to emotional stimuli that arise spontaneously when consumers are exposed to attractive promotional offers in marketplaces. However, consumers' ability to understand and utilize digital technology, known as digital literacy, also plays a role in shaping how they respond to available information and offers [3], [4].

Several previous studies have examined the relationship between digital promotion, pricing, and purchasing behavior using the Structural Equation Modeling-Partial Least Squares (SEM-PLS) approach. This method is widely recognized as effective for analyzing complex relationships among latent variables in behavioral research [5]. A study found that online store beliefs significantly influence impulsive buying behavior through consumer perceptions in digital environments [6]. Another study analyzed the adoption of digital technology in vocational education and revealed that communication, ease of use, and effectiveness influence the sustainability of digital learning after the pandemic [7]. A separate study demonstrated that perception and knowledge significantly affect competence in data analysis, emphasizing the importance of analytical literacy in AI-based learning environments [8]. Further research showed that sustainable leadership, cultural intelligence, and social adaptation significantly contribute to the formation of tolerance in

multicultural communities [9]. Another study revealed that internship program quality and mentor support positively influence work readiness, with technological tools strengthening these relationships [10]. A different study found that promotion and social influence significantly affect online purchase decisions, with convenience acting as a mediating variable [11]. Research on user behavior also indicated that service awareness and management quality influence visit frequency through interest and positive attitudes [12]. Additionally, a study demonstrated that work environment and motivation positively influence competence, which subsequently affects work readiness [13]. Another study revealed that technology readiness significantly influences the adoption of generative AI and improves organizational performance [14]. Furthermore, research indicated that digital capability contributes to innovation capability and operational efficiency through the utilization of AI technologies [15]. Finally, a study showed that perceived ease of use influences the adoption of generative AI, which in turn enhances competitive advantage in digital startups [16]. In addition, recent research highlights that conceptual understanding of validation methods significantly influences analytical validation in scientific contexts [17]. Recent research also demonstrates that simple technology implementation, such as Orange Data Mining, improves accessibility in chemometric analysis but requires adequate data literacy to enhance analytical quality [18]. Another study found that the application of the Savitzky–Golay method in spectral preprocessing shows consistent performance, although limitations in measurement indicators affect the evaluation of technology implementation and data literacy constructs [19]. In addition, research indicates that simple technology implementation can improve statistical understanding, but its effectiveness in more complex analytical tasks such as outlier detection remains limited without strong user competence [20]. Overall, the application of SEM-PLS across these studies confirms its robustness in analyzing complex relationships across consumer behavior, education, and digital transformation contexts.

Despite the extensive application of SEM-PLS in various domains, several research gaps remain. Previous studies have primarily examined direct relationships between variables such as promotion, pricing, and consumer behavior, while limited attention has been given to the simultaneous interaction between digital promotion, competitive pricing, purchase intention, and impulsive buying within a single integrated model. In addition, although digital literacy has been widely discussed in the context

of technology adoption and data competence, its role as a moderating variable in shaping consumer responses to digital marketing strategies in marketplace settings remains underexplored. Most prior research has focused on mediating effects or direct influences, rather than examining how digital literacy may strengthen or weaken the relationship between marketing stimuli and consumer behavior. Therefore, this study aims to analyze the influence of digital promotion and competitive pricing on purchase intention and impulsive buying, as well as to examine the moderating role of digital literacy in these relationships. By integrating these variables into a comprehensive SEM-PLS model, this research is expected to provide a deeper understanding of consumer behavior in digital marketplaces and contribute to both theoretical development and practical marketing strategies in the digital era.

2. METHOD

This study employs a quantitative approach using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to analyze the relationships between digital promotion, competitive pricing, online purchase intention, and impulsive buying, with digital literacy as a moderating variable. SEM-PLS was selected due to its strong capability in analyzing complex structural models involving latent variables and moderating relationships [21]. This method is also suitable for exploratory and predictive research in the context of digital consumer behavior.

Data collection was conducted using a questionnaire based on a 5-point Likert scale, ranging from strongly disagree to strongly agree. The respondents in this study consisted of 100 individuals who are active marketplace users with experience in online shopping activities. The variables used in this study include digital promotion (X1), competitive pricing (X2), digital literacy as a moderating variable (Z), online purchase intention (Y1), and impulsive buying (Y2). All variable indicators are developed based on relevant theoretical concepts and presented in table form without being described narratively.

Table 1 Variable, Definition, and Indicator

Variable	Type	Code	Indicator
Digital Promo (PROMO)	Independent	PROMO 1	Attractive discounts and vouchers
		PROMO 2	High intensity of promotional campaigns
		PROMO 3	Promotional information is easily found on the marketplace
Competitive Pricing (PRICE)	Independent	PRICE1	Lower price compared to other platforms
		PRICE2	Price is consistent with product quality
		PRICE3	Easy price comparison across products
Digital Literacy (DLIT)	Moderating	DLIT1	Ability to search for product

			information online
		DLIT2	Ability to use marketplace features
		DLIT3	Good understanding of digital transactions
Online Purchase Intention (PI)	Dependent	PI1	Intention to buy products in the marketplace
		PI2	Purchase interest based on obtained information
		PI3	Plan to purchase products in the near future
Impulsive Buying (IMP)	Dependent	IMP1	Unplanned purchasing behavior
		IMP2	Purchasing driven by spontaneous impulse
		IMP3	Purchasing due to promotional attraction

Data analysis was carried out through two main stages of SEM-PLS, namely the evaluation of the measurement model (outer model) and the structural model (inner model). The outer model evaluation was conducted to assess construct validity and reliability using outer loading, Average Variance Extracted (AVE), Cronbach's Alpha, and composite reliability (rho_c). In addition, multicollinearity testing was performed using the Variance Inflation Factor (VIF) to ensure no high correlation among indicators [22].

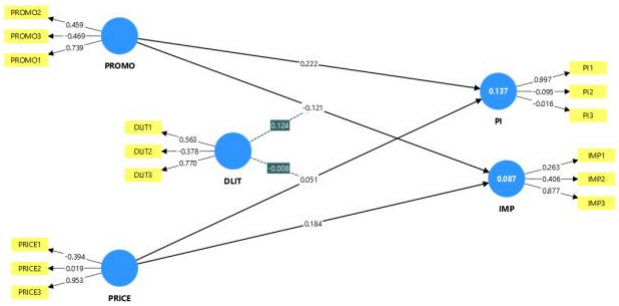

Fig. 1 Model Diagram and Intervariable Relationship

Furthermore, the structural model evaluation was used to examine the relationships between variables and the moderating effect of digital literacy on the relationships among constructs. The testing was conducted based on path coefficient values and bootstrap significance testing. The entire analysis process was performed using SEM-PLS software, which enables simultaneous and accurate estimation of complex relationships among research variables [23].

3. RESULT AND DISCUSSION

The results of the measurement model evaluation indicate that the overall construct validity and reliability are not yet fully satisfactory. Based on the outer loading values, several indicators demonstrate adequate representation of their constructs, such as PROMO1, PRICE3, DLIT3, PI1, and IMP3, which show relatively high loading values. However, a number of indicators present weak or even negative loadings, indicating that they do not consistently represent the intended constructs. This condition suggests that the

measurement instrument requires further refinement to improve construct consistency, particularly in capturing digital promotion, competitive pricing, and digital literacy dimensions in marketplace contexts [24].

The convergent validity results, as reflected in AVE values, show that all constructs are below the recommended threshold of 0.50. This indicates that the latent variables are not yet able to adequately explain the variance of their indicators. Similarly, Cronbach's Alpha and composite reliability (rho_c) values are generally below acceptable standards, suggesting weak internal consistency among indicators within each construct. These findings imply that respondents may have interpreted some items inconsistently or that the measurement scale requires revalidation for better contextual alignment with digital consumer behavior [25].

In addition, multicollinearity analysis using Variance Inflation Factor (VIF) indicates that all indicators are within acceptable thresholds (VIF < 5), meaning that there is no severe multicollinearity problem among indicators. This suggests that despite weak validity and reliability, the structural relationships among variables can still be interpreted without bias from redundant indicator overlap [23]. Furthermore, interaction constructs (DLIT × PROMO and DLIT × PRICE) show stable VIF values, indicating that the moderating model structure is statistically appropriate for further structural analysis.

From a theoretical perspective, the findings of this study highlight that although digital promotion and competitive pricing are widely recognized as important determinants of consumer behavior [1], [2], their measurement in this study does not yet fully capture their conceptual strength in the SEM framework. This is consistent with prior research emphasizing that digital marketing constructs often require strong contextual adaptation when applied to different populations and technological environments [5], [11]. Similarly, digital literacy as a moderating variable may not yet be fully reflected in behavioral measurement, although previous studies have shown its importance in shaping how individuals interpret and respond to digital information [8], [15].

The weak validity results of purchase intention and impulsive buying constructs also indicate inconsistencies in consumer response patterns. While prior studies suggest that promotional stimuli and pricing strategies significantly influence both rational and impulsive purchasing behavior [6], [11], the current findings imply that such relationships may be highly dependent on contextual understanding and measurement precision. This

reinforces the importance of ensuring that behavioral indicators are aligned with real consumer experiences in digital marketplaces [4], [12].

Despite limitations in measurement quality, the structural model remains conceptually relevant. The inclusion of digital literacy as a moderating variable is theoretically justified, as prior research has shown that digital capability and literacy influence how users process online information and make decisions in digital environments [7], [14]. Therefore, even though the measurement model requires improvement, the conceptual framework of this study remains valuable in explaining consumer behavior dynamics in digital marketplaces.

Overall, the findings suggest that SEM-PLS is a suitable approach for modeling complex relationships in digital consumer behavior research, but careful instrument development is essential to ensure validity and reliability. Future studies are recommended to refine measurement items and conduct pilot testing to improve construct stability before full-scale analysis [21], [22].

Construct & Indicator	Loading Factor	AVE	Cronbach's Alpha	rho_c	VIF
PROMO		**0.326**	**-0.092**	**0.208**	
PROMO1	0.777				1.003
PROMO2	0.455				1.008
PROMO3	-0.462				1.008
PRICE		**0.354**	**-0.001**	**0.147**	
PRICE1	-0.302				1.011
PRICE2	-0.034				1.006
PRICE3	0.925				1.015
DLIT		**0.351**	**-0.217**	**0.319**	
DLIT1	0.538				1.020
DLIT2	-0.277				1.021
DLIT3	0.770				1.002
PI		**0.335**	**-0.162**	**0.282**	
PI1	0.997				1.004
PI2	-0.050				1.021
PI3	-0.064				1.019
IMP		**0.335**	**0.013**	**0.545**	
IMP1	0.274				1.001
IMP2	0.388				1.001
IMP3	0.878				1.001
DLIT x PRICE	1.000				1.000
DLIT x PROMO	1.000				1.000

Construct & Indicator	Description
PROMO	**Not valid and not reliable**
PROMO1	Valid
PROMO2	Not valid
PROMO3	Not valid
PRICE	**Not valid and not reliable**
PRICE1	Not valid
PRICE2	Not valid
PRICE3	Valid
DLIT	**Not valid and not reliable**
DLIT1	Valid
DLIT2	Not valid
DLIT3	Valid
PI	**Not valid and not reliable**
PI1	Valid
PI2	Not valid
PI3	Not valid
IMP	**Not valid and not reliable**
IMP1	Not valid
IMP2	Not valid
IMP3	Valid

4. CONCLUSION

This study analyzed the influence of digital promotion and competitive pricing on online purchase intention and impulsive buying, with digital literacy as a moderating variable using the

SEM-PLS approach. The results of the measurement model indicate that the constructs have not yet achieved satisfactory levels of validity and reliability, suggesting that several indicators require refinement to better represent the theoretical constructs. However, the structural framework remains conceptually relevant in explaining consumer behavior in digital marketplaces. Overall, digital promotion and competitive pricing remain important factors in shaping consumer purchasing behavior, while digital literacy plays a crucial role in moderating how individuals interpret and respond to digital marketing stimuli. Despite limitations in measurement quality, this study provides useful insights for improving future research models and emphasizes the importance of developing more robust instruments in digital consumer behavior studies.

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