

VISUAL QUALITY AND THUMBNAILS: HOW E-COMMERCE PLATFORMS SHAPE CONSUMER PURCHASE BEHAVIOR

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Abstract

This study investigates the influence of product visual quality, with a specific focus on product thumbnails, on consumer purchasing behavior across two leading e-commerce platforms in Indonesia. Employing a quantitative methodology using Partial Least Squares Structural Equation Modeling (PLS-SEM), data were gathered from 150 active online shoppers in South Sulawesi. The findings demonstrate that product visual quality exerts a significant, direct impact on consumer purchasing behavior, emphasizing that clear and appealing visuals foster consumer trust and mitigate perceived risks. Furthermore, the visual quality of thumbnails not only enhances the perceived value of products but also bolsters the overall credibility of the platform, serving as both informational cues and trust signals. These results corroborate the Stimulus-Organism-Response (S-O-R) framework, demonstrating that high-quality visual function serves as a stimulus that influences consumer perceptions and purchasing intentions. This research contributes to the expanding body of digital marketing literature by reaffirming that visuals are not merely decorative elements but are essential in motivating online purchasing behaviors. Practical implications advise e-commerce managers to prioritize consistent, high-resolution imagery and an intuitive platform design to sustain consumer confidence and boost sales conversions.

Keywords: *Consumer Behavior, E-Commerce, Product Thumbnails, Product Visual Quality, Purchase Intention.*

INTRODUCTION

The rapid advancement of technology has become a key factor influencing how people meet their needs, offering convenience and perceived quality as added value (Jabbour Al Maalouf et al., 2025). This underscores the pivotal role of technology in driving the growth of e-commerce, which has emerged to meet consumer demands more efficiently, quickly, and flexibly. Online buying and selling activities through e-commerce platforms accommodate the increasingly practical and fast-paced lifestyles of today's consumers. According to a report by Mandiri Institute, the value of e-commerce transactions in Indonesia has continued to grow since 2017. Although it experienced a year-on-year decline of 4.7% to IDR 454 trillion in 2023, transaction values rebounded in 2024 with annual growth of 7.3%, reaching IDR 487 trillion. This trend indicates that public interest in using e-commerce platforms continues to rise annually.

As e-commerce platforms become increasingly popular, consumers are relying more heavily on product visuals as a key factor in their purchasing decisions. One of the most essential visual elements is the product thumbnail, the main image that appears first on the search page. A thumbnail serves as the initial representation of a product, and its quality significantly impacts consumers' first impressions. Visual brand design, encompassing elements such as color, logos, typography, and layout, plays a crucial role in shaping a brand's image, user experience, and purchase intentions on e-commerce platforms (Xiong, 2023). This also affects buying behavior across different product categories, especially fashion, which remains highly popular for online shopping. According to a survey (MasterClass, 2023), clothing and accessories are the most frequently purchased items on marketplaces, accounting for 89% of purchases. These data reinforce the notion that product visuals, including thumbnails, play a significant role in shaping consumers' purchasing decisions.

Despite strong evidence that visual quality influences purchase decisions, research remains limited on how the characteristics of e-commerce platforms themselves may strengthen or weaken this influence. Each online marketplace has its own unique user interface, product display features, and overall user experience design, all of which can shape how consumers perceive the quality of product visuals. For instance, recent industry reports indicate that some platforms attract hundreds of millions of visitors each month, maintaining the highest traffic in the country. At the same time, other popular marketplaces also draw substantial audiences during the same period. This variation highlights the importance of investigating how platform design differences, including visual layouts and product presentation styles, may moderate the relationship between product visual quality and consumer purchasing behavior. Given this context, the present study examines how two of the most widely used e-commerce platforms in Indonesia moderate the effect of product visual quality on consumer purchasing behavior in South Sulawesi. Although the impact of product visual quality has been extensively discussed in previous research, studies that specifically explore differences in interface features and visual elements between e-commerce platforms as moderating factors are limited. Additionally, local contexts such as South Sulawesi have rarely been the focus of similar research. It is expected that this study will provide new insights into how these platforms affect the relationship between product visual quality, particularly thumbnails, and consumer purchasing decisions.

LITERATURE REVIEW

E-commerce refers to the process of buying and selling goods and services online through the internet and has become one of the most popular shopping methods in the digital age. Many people prefer online shopping because it is convenient, quick, and often offers lower prices compared to brick-and-mortar stores. However, a consumer's decision to purchase on e-commerce platforms is not based solely on price. Three key factors that strongly influence consumer choices are price competitiveness, user reviews, and personalized recommendations (Huang, 2025). These factors serve as substitutes for in-store experiences, as they help build consumer confidence through digital information alone. Research by (Nasti et al., 2024) suggests that discounts, free shipping, and platform trust are key factors in attracting consumers. These insights suggest that the e-commerce purchase process begins with recognizing the need, searching for information, comparing products, making a purchase, and engaging in post-purchase activities, such as writing reviews or making repeat purchases. Each stage depends heavily on the accessibility of information, the security of transactions, and the overall user experience provided by the platform. Together, these elements influence the likelihood of customers making repeat purchases, reflecting their satisfaction and loyalty.

Product visual quality plays a crucial role in influencing consumer purchasing decisions, particularly in e-commerce. Since consumers cannot physically examine products online, visual elements such as images, lighting, and color contrast play a crucial role in shaping their perception of quality. Clear and attractive images help build trust and encourage quicker, more confident buying decisions. Optimized visuals not only make products look appealing but also reinforce perceived quality and reassurance. Packaging not only protects products but also communicates brand identity and values (Kridaningsih, 2023). This concept also applies online, where high-quality images, particularly those related to lighting and color, serve a similar purpose by attracting attention and shaping perceived quality. Compelling digital visuals enable consumers to see a product's physical features and foster an emotional connection that influences their buying choices. Product visual quality, encompassing image completeness, product videos, readability, and relevant information, is crucial in shaping consumer perceptions (Ali et al., 2022). High-quality images with good lighting and clear contrast enhance a product's visual appeal, strengthen perceptions of its benefits, and build trust in the e-commerce platform selling it. (Amsl et al., 2023) found that bright, sharp images with proper lighting and clear color contrast significantly improve product visual quality and foster positive consumer perceptions, ultimately increasing the likelihood of purchase. This study uses product images as the primary indicator, including image clarity, adequate lighting, and attractive color contrast (Amsl et al., 2023).

Product thumbnails serve as the first visual element consumers see when browsing e-commerce platforms. In this context, the visual quality of thumbnails greatly influences consumers' purchase decisions. (Loebbecke et al., 2024) reveal that visual features of thumbnails, such as image complexity, emotional valence, uniqueness, concreteness, and the presence of faces with emotional expressions, can significantly impact consumers' purchase choices. This indicates that consumers are not only attracted to a product's functional aspects but also to the emotional impression conveyed through its imagery. Engaging visuals in thumbnails can foster emotional engagement, encouraging purchases. Visual elements, such as embedded information, emotionally evocative colors, and overall aesthetics, including saturation, contrast, and composition, play a significant role in shaping consumers' purchase intentions (Tang et al., 2025). This research highlights the significance of human models in product images, which

can foster consumers' sense of social connection with the products. The inclusion of these elements in thumbnails greatly influences positive product perceptions and strengthens consumers' emotional bonds with what they view, directly impacting purchase decisions. In this study, the visual quality of product thumbnails is viewed as a key factor that moderates consumers' purchase decisions, especially for hedonic products. (Gao & Wu, 2025) highlight that in online shopping, consumers pursue both functional benefits and a satisfying emotional experience. Visuals that communicate emotional and aesthetic cues through color and distinctive imagery are more likely to capture consumers' attention and influence their purchase decisions. Based on the findings of (X. Li et al., 2014; Loebbecke et al., 2024), the indicators used to evaluate the influence of thumbnail visual quality on purchase decisions include Information Embedded in Product Photos, Social Presence in Product Photos, Complexity, Emotional Valence, and Color and Imagery Uniqueness, all of which have significant impacts on consumer purchase decision-making on e-commerce platforms.

The rapid growth of e-commerce platforms in recent years has significantly transformed how consumers interact with products and influenced their purchasing decisions. In the digital realm, visual elements —particularly product images and thumbnails, play a crucial role in capturing consumer attention. As the first point of contact, product thumbnails greatly influence consumers' perceptions of product quality. Product visual quality, encompassing image detail, resolution, and lighting, has a substantial impact on consumer interest and ultimately influences purchase intentions (Wang et al., 2023). Thumbnails serve as the initial representation of a product on e-commerce platforms and influence how consumers evaluate products before making a purchase. The Stimulus-Organism-Response (S-O-R) theory offers a relevant perspective for understanding how visual elements in thumbnails influence purchase decisions. According to this theory, product visual quality acts as a stimulus that affects consumer perceptions (organism) and results in a response in the form of a purchase decision (Jeong et al., 2022). Attractive visual designs, such as aesthetics, image complexity, and unique color use, reinforce positive product perceptions and evoke positive emotions that drive quicker purchase decisions.

Product visual quality also greatly influences purchase decisions even when the product lacks functional advantages over alternatives. Consumers tend to choose products with more appealing visuals, indicating that visual elements function not only as informational tools but also as drivers of product perception (Riswanto et al., 2025). Consumers' trust in product quality and the e-commerce platform is significantly influenced by visual elements displayed in product thumbnails (Tang et al., 2025). Therefore, visual quality, especially thumbnails, plays a crucial role in building trust and increasing purchase intentions on e-commerce platforms. In this study, the indicators used to analyze purchase decisions include Consumer Perceived Convenience (CFC), Customer Service Quality (CSQ), and Purchase Intention (PI), all of which relate to visual quality and the consumer's experience on the e-commerce platform.

METHOD

This study employs a quantitative descriptive methodology to examine and analyze the effects of e-commerce platforms, product visual quality, and thumbnail images on consumer purchase decisions. The research is conducted across several cities in South Sulawesi, focusing on e-commerce users who engage in online shopping. Data collection is scheduled from May to July 2025. An online questionnaire is used to gather data from respondents who meet specific criteria. This questionnaire implements a 5-point Likert scale to measure the study variables: e-commerce platforms, product visual quality, and thumbnail images. Participants include active e-commerce users who frequently shop online and have experience making purchase decisions influenced by product visual elements displayed on e-commerce platforms. A total of 150 respondents will participate, with data collected via Google Forms. Data analysis will be performed using the Partial Least Squares (PLS) technique.

RESULTS AND DISCUSSION

To determine the correlation coefficients among the constructs, factor loadings were employed. The loading values for the majority of items exceeded 0.70 or ranged from 0.746 (X1.1) to 0.924 (Y5). Nevertheless, one item, X3.8, was excluded due to insufficient loading weights or unmet threshold values (Hair et al., 2019). Similarly, the composite reliability (CR) values were either above the recommended threshold of 0.70 or fell within the range of 0.939 (X2) to 0.959 (Y) (refer to Table 1). To further evaluate and identify the relevant components, the average variance extracted (AVE) values were calculated, which ranged from 0.707 to 0.799, indicating excellent construct validity and exceeding the minimum acceptable value of 0.5 (Hair et al., 2019). Finally, the internal consistency of the constructs was assessed using Cronbach's alpha. The alpha values ranged from 0.918 (for X1) to 0.958 (Y), demonstrating that all factors possess reliable internal consistency (>0.70).

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Table 1. Measurement Model

Construct	Code	Loadings	CR	AVE	Cronbach's alpha
E-Commerce (X1)	X1.1	0.746	0.944	0.739	0.928
	X1.2	0.908			
	X1.3	0.870			
	X1.4	0.872			
	X1.5	0.867			
	X1.6	0.886			
Product Visual Quality (X2)	X2.1	0.863	0.939	0.754	0.918
	X2.2	0.886			
	X2.3	0.903			
	X2.4	0.864			
	X2.5	0.824			
Thumbnail (X3)	X3.1	0.754	0.956	0.707	0.948
	X3.2	0.759			
	X3.3	0.785			
	X3.4	0.768			
	X3.5	0.757			
	X3.6	0.897			
	X3.7	0.876			
	X3.9	0.782			
	X3.10	0.789			
Consumer Purchasing Behaviour (Y)	Y1	0.907	0.959	0.799	0.958
	Y2	0.865			
	Y3	0.876			
	Y4	0.902			
	Y5	0.924			
	Y6	0.896			
	Y7	0.886			

Table 2. Fornell-Larcker criterion

	X1	X2	X3	Y
E-Commerce (X1)	0.860			
Product Visual Quality (X2)	0.870	0.868		
Thumbnail (X3)	0.381	0.457	0.841	
Consumer Purchasing Behavior (Y)	0.811	0.843	0.427	0.894

The Fornell–Larcker criterion is one of the most established checks for assessing discriminant validity in PLS-SEM, ensuring that each construct shares more variance with its indicators than with other constructs in the model. According to (Hair et al., 2019) the rule of thumb, a construct's square root of Average Variance Extracted (AVE) shown on the diagonal should be greater than its correlations with any other latent variable. Looking at the table, we see that the diagonal values (square roots of AVE) for X1 (0.860), X2 (0.868), X3 (0.841), and Y (0.894) are all higher than their respective off-diagonal correlations. For instance, X1's diagonal value (0.860) exceeds its correlation with X2 (0.870) only very narrowly; in fact, the correlation is slightly higher than the diagonal value, which suggests a potential issue. Ideally, this should not happen because it indicates that X1 and X2 may be sharing too much variance, implying they are not entirely distinct constructs. This aligns with what your HTMT matrix already hinted at, that these two constructs may conceptually overlap. Meanwhile, other relationships appear acceptable. For example, X3's square root of AVE (0.841) comfortably exceeds its correlations with X1 (0.381), X2 (0.457), and Y (0.427). Likewise, Y's diagonal value (0.894) is higher than its correlations with X1 (0.811) and X2 (0.843). Although the Y–X2 correlation (0.843) comes quite close to the square root of Y's AVE, it does not exceed it, so discriminant validity is still supported for that pairing, albeit marginally. These patterns suggest that, while the overall model generally achieves discriminant validity according to the Fornell–Larcker criterion, the tight relationship between X1 and X2 warrants further scrutiny. When constructs are conceptually similar or when

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measurement items overlap in meaning, discriminant validity can be artificially compromised (Henseler et al., 2015). As a result, you may want to revisit item wording, refine the constructs theoretically, or test a second-order factor model if these dimensions truly belong to a broader higher-order construct

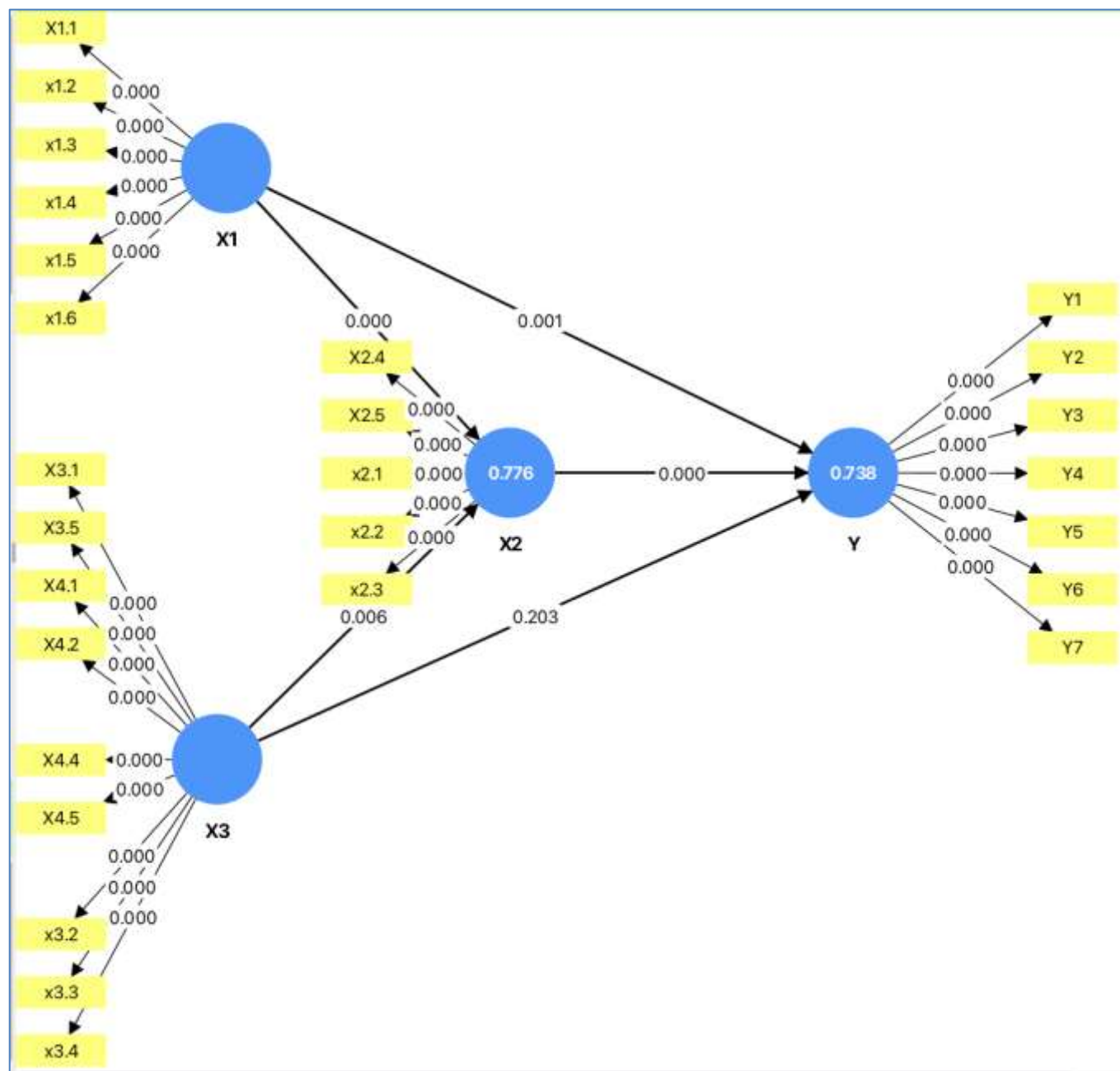


Image: Structural Equation Model

Table 3. Direct Result Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
X1 -> X2	0.814	0.809	0.048	16.955	0.000
X1 -> Y	0.758	0.754	0.056	13.616	0.000
X2 -> Y	0.534	0.529	0.105	5.099	0.000
X3 -> X2	0.148	0.156	0.054	2.755	0.006
X3 -> Y	0.138	0.145	0.058	2.375	0.018

The bootstrapping results provide compelling support for all hypothesized relationships in the structural model, indicating that each path coefficient is both statistically significant and practically meaningful. To start, the direct effect from $X1 \rightarrow X2$ is the strongest, with an original sample estimate of 0.814, a very low standard deviation (0.048), and an exceptionally high T-statistic of 16.955. A t-statistic greater than 1.96 at the 5% significance level confirms that the relationship is statistically significant (Hair et al., 2021). Here, the value far exceeds that threshold, implying that the impact of $X1$ on $X2$ is not only reliable but also robust across resamples. Similarly, the direct path from $X1 \rightarrow Y$ is also highly significant, with a path coefficient of 0.758, a standard deviation of 0.056, and a T-statistic of 13.616 ($p < 0.001$). This substantial direct effect suggests that $X1$, which likely represents product visual quality or a similar construct, directly shapes consumers' purchase decisions (Y). The practical implication is that when visual presentation quality improves, consumer confidence and purchase intention rise accordingly, a result that aligns with recent studies emphasizing the critical role of high-quality visuals in e-commerce contexts (Liu et al., 2025). A deeper reading of this direct effect reinforces the idea that e-commerce platforms act as experiential environments, not just transactional interfaces.

For example, when e-commerce platforms invest in intuitive navigation, high-quality product images, secure payment systems, and personalized recommendations, they lower perceived risk and increase consumer confidence (Chen et al., 2022). This sense of security and ease naturally translates into higher conversion rates and stronger purchasing intentions. Equally important is how this path coefficient fits within the broader structure of the model. While the indirect paths (such as through $X2$) add nuance by showing that platform features can also build trust or affect perceived value, the large direct coefficient (0.758) reveals that many consumers make rapid judgments based on their immediate perception of the platform itself. In digital settings where physical inspection is impossible, the platform effectively becomes the "storefront"; it must therefore deliver a clear signal of credibility and quality to convert browsing into actual purchasing behavior (Henseler et al., 2015). Practically, e-commerce managers should look beyond generic digital marketing tactics and focus on the detailed design elements that consumers interact with daily. Platform speed, mobile responsiveness, clear product categorization, and high-definition images are no longer just "nice-to-haves"; they are now critical predictors of purchasing behavior. This aligns with findings by (Guo et al., 2023) those who stress that consumers are increasingly sensitive to digital 'trust signals' embedded in platform design, which can enhance loyalty and drive repeated purchase behavior.

The path $X2 \rightarrow Y$ stands out as a clear demonstration of how product visual quality directly influences consumer purchasing behavior with a substantial coefficient of 0.534 and a significant T-statistic of 5.099. This strong direct effect suggests that when online shoppers perceive product visuals as transparent, attractive, and trustworthy, they are more likely to complete their purchases with confidence. This finding is consistent with recent research (Liu et al., 2025), which emphasizes that visual aesthetics serve as powerful diagnostic cues that reduce perceived risk in online environments where physical inspection is not possible. Moreover, the strength of this pathway reinforces the argument that well-crafted visuals do not merely decorate the product page but fundamentally build consumer trust and trigger purchase decisions. Notably, this link also illustrates what scholars like (Preacher & Hayes, 2008) have long described: that mediating pathways reveal the hidden mechanisms through which an independent factor exerts its influence. In this context, although factors such as brand reputation or platform usability still matter, it is the perceived product visual quality that carries significant weight in shaping consumers' final choices. Recent studies in e-commerce further support this, showing that visuals can even override textual descriptions or price cues when they are especially vivid and professionally presented (Yang et al., 2024). This layered effect highlights the deeply intertwined nature of visual merchandising and consumer psychology. In practice, it signals that online retailers should treat high-quality images not as optional enhancements but as central elements of the value proposition.

As (Hair et al., 2019) noted, significant path coefficients like this one point to the practical impact of research models: investments in visual presentation directly translate into better consumer outcomes. When consumers can see product details, angles, and contextual usage, their uncertainty diminishes, their trust grows, and the likelihood of purchase increases. Turning to the paths involving $X3$, both show weaker but still significant effects. The path $X3 \rightarrow X2$ has a coefficient of 0.148, a T-statistic of 2.755, and a p-value of 0.006. Meanwhile, $X3 \rightarrow Y$ shows a similar trend with a coefficient of 0.138, a T-statistic of 2.375, and a p-value of 0.018. Although these paths are modest in magnitude, they suggest that secondary factors, perhaps social influence, word-of-mouth, or brand trust, play a supporting role in shaping both perceptions of the platform and final purchase decisions. This finding is consistent with (Yang et al., 2024) those who emphasize that while visuals and platform trust form the core, peripheral cues such as user reviews and social proof still hold explanatory value in digital purchasing contexts. Taken together, these bootstrapping results confirm that the proposed structural model has strong empirical support: all path

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coefficients are significant at $p < 0.05$, T-values exceed the critical cut-offs, and the standard deviations are acceptably low, indicating stability across subsamples. Such findings not only validate the theoretical framework but also offer clear strategic insights. E-commerce platforms should continue to enhance their visual presentation, ensure platform credibility, and not neglect complementary factors such as community trust or influencer endorsements to strengthen the overall purchase decision process.

Table 4. Indirect Result Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
X1 -> X2 -> Y	0.435	0.429	0.093	4.654	0.000
X3 -> X2 -> Y	0.079	0.081	0.030	2.617	0.009

The mediation results show that the indirect path $X1 \rightarrow X2 \rightarrow Y$ has an original sample estimate of 0.435, with a standard deviation of 0.093, yielding a T-statistic of 4.654 and a p-value of less than 0.005. This confirms that the indirect effect of X1 on Y through X2 is both statistically significant and practically meaningful. In structural equation modelling, a T-statistic greater than 1.96 indicates significance at the 5% level, and a p-value below 0.05 reinforces this result (Hair et al., 2021). The strength of this mediation suggests that X2 plays a crucial role in explaining how X1 ultimately influences Y. For example, if X1 represents platform design or interface quality, and X2 represents product visual quality. The finding shows that improvements in platform features will indirectly drive consumer purchasing behavior by enhancing how product visuals are perceived.

Similarly, the indirect effect $X3 \rightarrow X2 \rightarrow Y$ is smaller in magnitude but remains significant, with a path coefficient of 0.079, a standard deviation of 0.030, a T-statistic of 2.617, and a p-value of 0.009. This indicates that X3 has a significant indirect influence on Y through its impact on X2. While the direct effect may be limited, the mediating pathway reveals that X3 still contributes to shaping consumer behavior indirectly by improving perceived product visuals. This pattern is consistent with mediation theory, as discussed by (Preacher & Hayes, 2008) those who argue that identifying indirect effects is crucial for understanding the deeper mechanisms through which an independent variable transmits its influence to the dependent outcome.

From a practical perspective, these results emphasize that managers should not overlook the mediating role of product visual quality when designing platform improvements or developing supporting factors such as brand trust or customer engagement initiatives. Even factors that do not directly affect purchase behavior can exert a meaningful influence if they enhance the way consumers perceive product images or thumbnails. This layered effect reflects the Stimulus-Organism-Response (S-O-R) framework, where the stimulus ($X1$ = e-commerce platforms or $X3$ = thumbnail) triggers an internal state ($X2$) that leads to a consumer purchasing behavioral response (M. Li et al., 2022). In the context of digital commerce, this means that clear, engaging visuals act as a bridge connecting platform attributes or additional factors to actual purchasing decisions.

CONCLUSION

Based on the findings, online sellers and platform managers should place greater emphasis on optimizing product visual quality. High-resolution images, consistent lighting, clear angles, and appealing product thumbnails should be treated as essential components rather than optional enhancements. Retailers could consider providing training for small sellers on how to create effective thumbnails that align with platform standards, ensuring that consumers perceive the products as trustworthy and appealing at first glance. E-commerce platforms can also establish quality guidelines for product images to maintain consistency across listings and enhance the platform's credibility. These results highlight that product visuals are far more than just decorative content. For decision-makers in digital marketing, this means that investments in visual merchandising directly contribute to improved consumer trust and higher conversion rates. Platform designers should focus on integrating user-friendly interfaces that effectively showcase thumbnails, allowing consumers to view multiple images, zoom in, and easily compare visual details. This approach will reduce perceived risk and support more confident purchasing behavior. Furthermore, platform managers should ensure that the visual presentation is consistent with other elements, such as secure payment gateways and reliable customer service, to reinforce overall trust. While this study focused on e-commerce users in South Sulawesi, future research could expand the sample to include different regions or countries to explore cultural variations in how consumers interpret product visuals. It would also be worthwhile to investigate how emerging technologies such as augmented reality, interactive 3D visuals, or virtual try-ons influence perceived product quality and purchase decisions. Another direction is to test the moderating role of consumer demographics

such as age, gender, or shopping frequency to uncover potential differences in visual cue sensitivity. Longitudinal studies could help capture how these relationships evolve as consumers become more accustomed to advanced visual technologies.

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