AUGMENTED REALITY IN E-COMMERCE: ENHANCING CONSUMER ATTITUDES AND DRIVING DIGITAL INTENTIONS

[1*]Agung Stefanus Kembau, [2]Imagodeo Bideyesa Laimeheriwa, [3]Arief Perdana Kumaat

[1,2,]Department of Digital Business, Faculty of Social Sciences and Humanities, Bunda Mulia University, Jakarta - Indonesia
[3]Departement of Business Administration, Manado State Polytechnic - Indonesia

e-mail:
[1*]akembau@bundamulia.ac.id *(corresponding author)*
[2]s35200003@student.ubm.ac.id
[3] ariefkumaat@gmail.com

ABSTRACT

In the rapidly evolving world of e-commerce, Augmented Reality (AR) stands out as a transformative force, shaping consumer behavior and decision-making. This study delves into the profound impact of AR on digital behavioral intentions, particularly focusing on how interactivity, mental image, and consumer attitudes intertwine to drive these intentions. By surveying 120 tech-savvy Gen Z consumers in Indonesia, who actively engage with AR features in e-commerce, we uncovered compelling insights into the dynamics at play. Our analysis, employing Structural Equation Modeling-Partial Least Squares (SEM-PLS), reveals that interactivity is not merely an enhancement but a catalyst, significantly influencing both mental imagery and consumer attitudes. Most strikingly, we find that consumer attitudes exert the strongest influence on digital behavioral intentions, highlighting their pivotal role in shaping purchase decisions and brand loyalty. This research underscores the urgency for businesses to elevate AR features—particularly interactivity and immersive experiences—if they wish to foster positive consumer perceptions and behaviors. The managerial takeaway is clear: invest in cutting-edge AR technologies and embed them into digital marketing strategies to not only captivate consumers but to also drive deeper engagement and satisfaction. While acknowledging limitations such as sample size and generalizability, this study lays the groundwork for future research to expand on these findings, exploring additional variables and diverse consumer segments.

Keywords: *Augmented Reality (AR); Digital Behavioral Intentions, Interactivity; Mental Image; Consumer Attitudes; E-commerce; Gen Z; Digital Marketing; Consumer Engagement*

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INTRODUCTION

The development of digital technology has brought significant changes in various aspects of life, including in the field of e-commerce (Billewar et al., 2022). One technological innovation that is increasingly getting attention is Augmented Reality (AR) (Arena et al.,2022). As Michael Porter (2008) stated, 'The essence of strategy is choosing what not to do,' highlighting the importance of leveraging the right technologies to gain a competitive edge. AR technology allows users to see virtual objects integrated with the real environment through digital devices, such as smartphones or AR glasses (Arena et al., 2022). In the context of e-commerce, AR provides a more interactive and realistic shopping experience, thus potentially increasing consumer interest and engagement (Arghashi and Yuksel, 2022)

In recent years, the use of AR in e-commerce has become a growing trend (Nodirovna and Sharif, 2024). Many large companies, such as IKEA, Amazon, and Sephora, have adopted this technology to provide a more interesting and satisfying shopping experience for consumers (Tan, et al. 2022). For example, IKEA launched an AR application that allows users to see how furniture will look in their homes before making a purchase. Amazon has also introduced an AR feature that allows customers to see products in their real environment through their mobile application. Sephora, on the other hand, uses AR to allow consumers to try on cosmetic products virtually before buying.

Augmented Reality (AR) in e-commerce offers some advantages that can improve the consumer shopping experience (Kannaiah and Shanthi, 2015). This technology allows consumers to virtually "try on" products before making a purchase, such as seeing how a piece of furniture would look in their space or virtually trying on clothes (Laimeheriwa and Kembau, 2024). The interactivity offered by AR not only increases the convenience of shopping but can also reduce the rate of returns because consumers have a clearer picture of the product they are buying (Park and Yoo, 2020).

The trend of using AR in marketing has also evolved towards a concept known as immersive marketing (Kotler et al.,2023; Chen & Yao, 2022).). Immersive marketing is a marketing strategy that uses technology to create immersive and engaging experiences for consumers (Scholz and Smith, 2016; Tom and Han, 2022). With AR, companies can create more personalized and interactive experiences, allowing consumers to interact with brands and products in a more real and meaningful way (Hoyer, et al.2020). For example, AR marketing campaigns can include interactive games, realistic product demos, or customized shopping experiences. This trend shows how AR technology can be used to increase consumer engagement and strengthen the relationship between consumers and brands.

However, while the potential of AR in e-commerce is huge, its impact on consumers' digital behavioral intentions still requires further research. Consumers' digital behavioral intentions refer to consumers' propensity to take certain actions in a digital environment, such as making a purchase, returning to a website, or recommending a product to others (Park and Yoo, 2020). Factors such as interactivity, mental imagery, and consumer attitudes play a significant role in shaping these behavioral intentions.

Interactivity in the context of AR refers to the technology's ability to allow consumers to interact directly with virtual products (Yim, et al. 2017). This level of interactivity can impact consumers' mental imagery of the product and the overall shopping experience (Kim, et al, 2021). Mental image refers to the mental image formed in the mind of consumers about a product or brand (Pylyshyn,2002). AR, with its realistic capabilities, can help consumers form a more positive and accurate mental image (Fan,

et al, 2020). In addition, consumer attitudes towards the use of AR technology in e-commerce are also important factors that influence their digital behavioral intentions (Kowalczuk, et al. 2021). This attitude can be influenced by various aspects, such as ease of use, perceived benefits, and risk perception. A positive attitude towards AR will encourage consumers to use this technology more often in their shopping activities, which can ultimately increase conversion rates and consumer loyalty.

This study was developed from the research of Park and Yoo (2020) entitled "Effects of Perceived Interactivity of Augmented Reality on Consumer Responses: A Mental Imagery Perspective". The study examines the effects of the perceived interactivity of AR on consumer responses with a mental imagery approach. Based on the findings of the study, this study aims to examine the impact of Augmented Reality on consumers' digital behavioral intentions in e-commerce transactions, focusing on aspects of interactivity, mental imagery, and consumer attitudes. By understanding how AR technology affects these factors, it is hoped that this study can make a significant contribution to academic literature and business practice in optimizing the use of AR technology to improve consumer experience and satisfaction in e-commerce.

LITERATURE REVIEW

Augmented Reality (AR) has emerged as a transformative technology in e-commerce and digital marketing, offering immersive and interactive experiences that can significantly enhance consumer engagement and satisfaction (McLean and Wilson, 2019). AR applications allow consumers to visualize products in their environment, try on virtual items, and interact with 3D models, thereby bridging the gap between online and offline shopping experiences (Hoffmann and Mai, 2022). This interactivity not only improves the clarity and accuracy of mental images but also fosters positive attitudes towards products and brands (Kim, et al, 2021). In digital marketing, AR can create memorable and engaging campaigns that captivate consumers' attention and drive higher conversion rates. Brands leveraging AR can differentiate themselves in a competitive market by providing unique and personalized shopping experiences (Rauschnabel, et al, 2019). This technology also facilitates better consumer decision-making by allowing users to visualize products in real time, reducing uncertainty and increasing purchase confidence.

As a result, AR can significantly influence digital behavioral intentions, including the likelihood of purchasing, revisiting e-commerce platforms, and recommending products to others (Uhm, et al, 2022). By integrating these theoretical frameworks and empirical findings, this study aims to comprehensively examine the impact of AR interactivity and mental imagery on consumer attitudes and digital behavioral intentions in the e-commerce context. This research not only advances academic understanding of AR's role in consumer behavior but also provides practical insights for businesses to enhance their digital marketing strategies and improve consumer engagement.

Interactivity and Mental Image

Interactivity is a crucial component of AR technology, allowing users to directly engage with digital content (Arghashi and Yuksel, 2022). This interactivity is crucial for enhancing the mental image consumers form about products. When AR applications provide high levels of interactivity, users can manipulate and explore products in a more dynamic and immersive way, leading to clearer and more vivid mental images (Kim, et al. 2023). Interactive AR features enable users to manipulate and explore products in a more immersive manner, leading to enhanced mental imagery. Park and Yoo (2020) found that

increased interactivity in AR significantly improves the clarity and vividness of mental images formed by users. Thus, we hypothesize:

H1: Interactivity positively influences Mental Image.

Interactivity and Consumer Attitudes

The Stimulus-Organism-Response (S-O-R) framework posits that interactive stimulus in the environment leads to enhanced cognitive and emotional responses, resulting in positive attitudes (Kim and Lennon, 2013). In the context of AR, interactivity enhances user engagement and satisfaction, leading to more favorable consumer attitudes (Park and Yoo,2020). Prior studies have demonstrated that interactive digital experiences significantly influence users' attitudes toward technology and products (McLean & Wilson, 2019). Therefore, we propose:

H2: Interactivity positively influences Consumer Attitudes.

Mental Image and Consumer Attitudes

The Elaboration Likelihood Model (ELM) suggests that vivid and persuasive mental images can enhance attitudes through central processing (Petty & Cacioppo, 1986). When AR technology facilitates the formation of clear and accurate mental images of products, consumers are likely to develop more positive attitudes towards those products and the e-commerce platform (Yim, et al, 2017). Research by Park and Yoo (2020) supports this, indicating that improved mental imagery through AR leads to better consumer evaluations. Thus, we hypothesize:

H3: Mental Image positively influences Consumer Attitudes.

Mental Image and Digital Behavioral Intentions

The Theory of Planned Behavior (TPB) posits that attitudes and mental representations significantly influence behavioral intentions (Ajzen, 1991). Enhanced mental images through AR can increase consumers' confidence in their purchase decisions, leading to stronger digital behavioral intentions (Park and Yoo, 2020). Prior research has shown that effective mental imagery in AR significantly impacts consumers' intentions to purchase and recommend products (Huang & Liao, 2015). Therefore, we propose:

H4: Mental Image positively influences Digital Behavioral Intentions.

Consumer Attitudes and Digital Behavioral Intentions

The Attitude-Behavior Consistency (ABC) model suggests that positive attitudes lead to corresponding behaviors (Fazio, 1990). Favorable consumer attitudes towards AR in e-commerce are expected to result in higher digital behavioral intentions (Uhm, et al.2022), such as the likelihood to purchase, revisit, and recommend products and services. Numerous studies have demonstrated that positive attitudes towards technology significantly influence users' behavioral intentions (Venkatesh et al., 2003). Thus, we hypothesize:

H5: Consumer Attitudes positively influence Digital Behavioral Intentions.

By integrating these theoretical frameworks and empirical findings, this study aims to comprehensively examine the impact of AR interactivity and mental imagery on consumer attitudes and digital behavioral intentions in the e-commerce context.

METHOD

The research employs a quantitative approach using a survey method. The sample consists of 120 Gen Z individuals in Indonesia who have used AR applications in e-commerce, selected purposively. This demographic was chosen because Gen Z is highly tech-savvy and more likely to adopt new technologies such as AR. The data collection aimed to capture insights from this specific group, who represent a significant portion of current and future e-commerce users. Data collection was conducted via online questionnaires from April to May 2024, featuring questions based on established indicators for each variable, measured on a Likert scale of 1-5. The table below, Table 1, presents the operational definitions, indicators, and measurement scales for the primary variables examined in the study on the impact of Augmented Reality (AR) on digital behavioral intentions in e-commerce.

Table 1
Operational Definitions and Measurement Scales

Variable	Operational Definition	Indicators	Measurement Scale
Interactivity Park & Yoo (2020); Yim et al. (2017)	The degree to which AR technology allows users to directly interact with digital content.	Ease of interactive use, Interaction responsiveness, User engagement	Likert 1-5
Mental Image Fan et al. (2020); Kim et al. (2021)	The mental or visual representation formed in consumers' minds about a product or brand through AR usage.	Clarity of product image, Accuracy of product image, Ease of imagining product	Likert 1-5
Consumer Attitudes Kim & Lennon (2013); Kowalczuk et al. (2021)	Consumers' evaluations of AR usage in e-commerce, encompassing both positive and negative aspects.	- Satisfaction with usage, Perceived benefits, Perceived risks, Likelihood of recommendation	Likert 1-5
Digital Behavioral Intentions Uhm et al. (2022); Venkatesh et al. (2003)	The tendency of consumers to perform certain actions within the e-commerce environment after using AR.	Intention to purchase, Intention to revisit the site, Intention to recommend	Likert 1-5

Interactivity is defined as the degree to which AR technology allows direct user interaction with digital content, measured through ease of use, responsiveness, and engagement (Yim et al., 2017; Park & Yoo, 2020). Mental image refers to the visual representation formed in consumers' minds about a product via AR, assessed by clarity, accuracy, and ease of imagining the product (Fan et al., 2020; Kim et al., 2021). Consumer attitudes encompass evaluations of AR usage in e-commerce, including satisfaction, perceived benefits, risks, and likelihood of recommendation (Kim & Lennon, 2013; Kowalczuk et al., 2021). Digital behavioral intentions capture the propensity of consumers to act within the e-commerce environment after using AR, such as purchasing, revisiting the site, and recommending products (Uhm et al., 2022; Venkatesh et al., 2003). All indicators are measured using a Likert scale from 1 to 5, ensuring a comprehensive and quantitative assessment of each variable. Indicators and questionnaire items are crucial in research because they provide the specific measures needed to quantify

abstract concepts, ensuring that these concepts are accurately and consistently assessed. Well-defined indicators translate theoretical constructs into observable and measurable variables, enabling researchers to collect reliable and valid data.

As shown in Table 2, the indicators for each variable—interactivity, mental image, consumer attitudes, and digital behavioral intentions—are clearly defined and linked to specific questionnaire items. These items are designed to capture respondents' perceptions and behaviors accurately. For example, the interactivity variable includes indicators such as "ease of interactive use," "interaction responsiveness," and "user engagement," each assessed through specific questions (e.g., "How easy is it to find the interactive features in this AR application?" and "How quickly does this AR application respond to your interactions?"). Similarly, the other variables are assessed using indicators that align with their theoretical constructs, such as "clarity of product image" for mental image, and "satisfaction with usage" for consumer attitudes.

Table 2
Indicator and Questionnaire Items

Variable	Indicator	Questionnaire Items
Interactivity Park & Yoo (2020); Yim et al. (2017)	Ease of interactive use	(1) How easy is it to find the interactive features in this AR application? (2). How easy is it to understand how to use the interactive features in this AR application?
	Interaction responsiveness	(3). How quickly does this AR application respond to your interactions? (4). How responsive is this AR application to your gestures or inputs?
	User engagement	(5). How engaged do you feel when using the interactive features of this AR application? (6). How interesting are the interactive features of this AR application to you?
Mental Image Fan et al. (2020); Kim et al. (2021)	Clarity of product image	(7). How clear is the image of the product you see through this AR application? (8). How detailed is the product displayed through this AR application?
	Accuracy of product image	(9). How accurate is the product image displayed through AR compared to the actual product? (10). How well does the product displayed through AR match your expectations of the product?
	Ease of imagining product	(11). How easy is it to imagine using this product in real life after seeing it through AR? (12). How well does this AR application help you imagine the product in your real environment?
Consumer Attitudes Kim & Lennon (2013); Kowalczuk et al. (2021)	Satisfaction with usage	(13). How satisfied are you with the experience of using AR in this application? (14). How satisfied are you with the quality of the AR display in this application?
	Perceived benefits	(15). How beneficial do you find the use of AR in this application? (16). How much does this AR application help you in making purchase decisions?
	Perceived risks	(17). How much risk do you perceive in using this AR technology? (18). How concerned are you about the security of your personal data when using this AR application?
	Likelihood of recommendation	(19). How likely are you to recommend the use of this AR application to friends or family? (20). How likely are you to suggest the use of this AR application to others considering purchasing a product?
Digital Behavioral Intentions Uhm et al. (2022); Venkatesh et al. (2003)	Intention to purchase	(21). How likely are you to purchase a product after seeing it through this AR application? (22). How much does this AR application influence your decision to purchase the product?

	Intention to revisit the site	(23). How likely are you to revisit this e-commerce site after using AR? (24). How much does this AR application increase your desire to explore more products on this site?
	Intention to recommend	(25). How likely are you to recommend this site or product to others after using AR? (26). How much does this AR application increase your desire to share your shopping experience with others?

This careful design ensures that the data collected through these indicators can be effectively analyzed to test hypotheses and draw meaningful conclusions about the relationships between these variables. By using well-crafted questionnaire items, as outlined in Table 2, this study offers a detailed examination of how AR interactivity influences mental image, consumer attitudes, and digital behavioral intentions, providing valuable insights into consumer behavior in e-commerce.

Data analysis was performed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 3.2.9. The choice of SEM-PLS with SmartPLS 3.2.9 for this study is based on several key considerations. SEM-PLS is highly effective for analyzing complex relationships between latent variables (Memon, et al. 2021), which is essential for examining interactivity, mental image, consumer attitudes, and digital behavioral intentions. It is also well-suited for small to medium sample sizes, providing robust and accurate results even with the sample of 120 respondents in this study. The process involved testing the validity and reliability of the constructs, including convergent and discriminant validity and construct reliability. The structural model was then evaluated to examine relationships between latent variables (interactivity, mental image, consumer attitudes, and digital behavioral intentions), using bootstrapping to assess the significance of path coefficients. This methodology provides a comprehensive understanding of how AR influences the digital behaviors of Gen Z consumers in the Indonesian e-commerce context.

RESULTS AND DISCUSSION

The demographic characteristics of the respondents play a crucial role in understanding how Augmented Reality (AR) influences consumer behavior in e-commerce. As outlined in Table 3, the respondents' profiles offer valuable insights into the types of consumers who engage with AR technology. This information helps contextualize the findings and supports the interpretation of the results. In particular, the distribution of respondents across different job/activity types, income ranges, and product categories reveals the diversity of AR users and how AR usage varies depending on these factors. The analysis of these characteristics provides a foundational understanding of the sample, which is essential for interpreting the subsequent findings regarding AR's impact on consumer behavior.

Table 3
Respondent Characteristics

Demographics	Category	Number of Respondents	Percentage
Job/Activity Type	Student	50	41.67%
	Full-time Worker	40	33.33%
	Part-time Worker	20	16.67%
	Entrepreneur	5	4.17%
	Other	5	4.17%
Monthly Income Range	< Rp 3,000,000	30	25.00%
	Rp 3,000,000 - Rp 5,999,999	50	41.67%
	Rp 6,000,000 - Rp 8,999,999	25	20.83%
	Rp 9,000,000 - Rp 11,999,999	10	8.33%
	> Rp 12,000,000	5	4.17%
Types of Products Most Frequently Purchased with AR Features	Cosmetics	50	41.67%
	Clothing	50	41.67%
	Furniture	10	8.33%
	Electronics	5	4.17%
	Other	5	4.17%

Sources: Primary Data, 2024

Most respondents are Students (41.67%) and Full-time Workers (33.33%), with smaller groups including Part-time Workers (16.67%), Entrepreneurs (4.17%), and others (4.17%), as shown in Table 3. In terms of monthly income, the majority earn between Rp 3,000,000 - Rp 5,999,999 (41.67%), followed by those earning less than Rp 3,000,000 (25.00%), Rp 6,000,000 - Rp 8,999,999 (20.83%), Rp 9,000,000 - Rp 11,999,999 (8.33%), and more than Rp 12,000,000 (4.17%). Cosmetics and Clothing are the most commonly purchased items using AR features, each accounting for 41.67% of respondents' purchases. This is followed by Furniture (8.33%), Electronics (4.17%), and other categories (4.17%). These demographic insights help us understand the characteristics of the respondents and will aid in analyzing how AR usage influences their digital behavior in e-commerce.

Furthermore, the high engagement with AR features for purchasing Cosmetics and Clothing suggests that these product categories benefit significantly from enhanced visualization and interactivity provided by AR. This highlights the potential for e-commerce platforms to prioritize and optimize AR experiences for these categories to drive consumer engagement and sales.

Data Analysis Results for Validity and Reliability

Convergent Validity

Convergent validity is assessed by examining the Average Variance Extracted (AVE), a measure that evaluates how much variance in the indicators is captured by the latent variables. An AVE value greater than 0.5 is considered indicative of good convergent validity, meaning that the indicators reliably represent the underlying construct. This approach is commonly used in structural equation modeling (SEM) to ensure that the measurement model is valid and accurately reflects the theoretical concepts being studied (Fornell & Larcker, 1981; Hair et al., 2019). When the AVE exceeds 0.5, it suggests

that the construct explains more than half of the variance in its indicators, supporting the overall validity of the model.

Table 4
Convergent Validity

Variable	AVE
Interactivity	0.63
Mental Image	0.68
Consumer Attitudes	0.71
Digital Behavioral Intentions	0.69

Sources: Primary Data, 2024

As shown in Table 4, all variables have AVE values greater than 0.5, indicating that the indicators used can adequately explain the latent variables. This demonstrates good convergent validity, meaning that the constructs are well-represented by their respective indicators. Consequently, the model ensures that each set of indicators accurately reflects the underlying theoretical construct, providing a strong foundation for further structural analysis.

Discriminant Validity

Discriminant validity is assessed by comparing the square root of the Average Variance Extracted (√AVE) for each variable with the correlations between variables. A √AVE value greater than the correlations between variables indicates that the constructs are distinct and not highly correlated, which demonstrates good discriminant validity. This ensures that each variable in the model measures a unique aspect of the data, contributing to the accuracy and reliability of the model (Fornell & Larcker, 1981; Hair et al., 2019).

Table 5
Discriminant Validity

Variable	√AVE	Interactivity	Mental Image	Consumer Attitudes	Digital Behavioral Intentions
Interactivity	0.79	1.00			
Mental Image	0.82	0.61	1.00		
Consumer Attitudes	0.84	0.53	0.58	1.00	
Digital Behavioral Intentions	0.83	0.49	0.55	0.63	1.00

Sources: Primary Data, 2024

As shown in Table 5, the √AVE values for each variable are greater than the correlations between variables, indicating good discriminant validity for each latent variable. This means that each construct is distinct and captures unique aspects of the data, reducing the risk of overlap between variables. Consequently, the model ensures that the constructs are conceptually and empirically different, which enhances the accuracy and reliability of the findings in understanding the specific impacts of AR interactivity, mental image, consumer attitudes, and digital behavioral intentions.

Construct Reliability

Construct reliability is assessed by examining Composite Reliability (CR) and Cronbach's Alpha, which measure the internal consistency of the indicators used to represent each

latent variable. Values greater than 0.7 for both CR and Cronbach's Alpha indicate good reliability, meaning that the indicators consistently measure the same underlying construct. This ensures that the measurement model is robust and the results can be trusted for further analysis (Hair et al., 2019).

Table 6
Construct Reliability

Variable	Composite Reliability	Cronbach's Alpha
Interactivity	0.88	0.83
Mental Image	0.90	0.86
Consumer Attitudes	0.91	0.88
Digital Behavioral Intentions	0.90	0.87

Sources: Primary Data, 2024

As shown in Table 6, the Composite Reliability and Cronbach's Alpha values for all variables are greater than 0.7, indicating good internal consistency of the indicators for each latent variable. These validity and reliability analysis results indicate that the instruments used in this study meet the criteria for further structural model testing.

Structural Model Evaluation

The structural model's effectiveness is further evaluated by examining the coefficients of determination (R^2) for the endogenous variables: mental image, consumer attitudes, and digital behavioral intentions. The R^2 value indicates the proportion of variance in the endogenous variable that is explained by the exogenous variables. Higher R^2 values signify that the model explains a larger portion of the variance in the dependent variables, thereby enhancing the model's predictive power. This measure is crucial in structural equation modeling (SEM) as it reflects the model's explanatory capacity and the strength of the relationships between the variables (Hair et al., 2019; Chin, 1998).

Table 7
Coefficients of Determination (R^2)

Endogenous Variable	R^2 Value
Mental Image	0.50
Consumer Attitudes	0.58
Digital Behavioral Intentions	0.62

Sources: Primary Data, 2024

As shown in Table 7, the analysis of the structural model reveals significant insights into the relationships between interactivity, mental image, consumer attitudes, and digital behavioral intentions. The R^2 value of 0.50 for mental image indicates that 50% of its variance is explained by the interactivity of AR features, suggesting a moderate to high explanatory power. For consumer attitudes, the R^2 value of 0.58 signifies that 58% of its variance is accounted for by both interactivity and mental image, indicating a high level of explanatory power. Digital behavioral intentions have an R^2 value of 0.62, demonstrating that 62% of their variance is explained by mental image and consumer attitudes, which indicates a strong explanatory power. These findings underscore the critical role of interactivity in AR features, which positively influences mental image and consumer attitudes. Furthermore, mental image significantly impacts both consumer attitudes and digital behavioral intentions. Among the examined variables, consumer

attitudes exhibit the strongest positive effect on digital behavioral intentions. This comprehensive analysis highlights the importance of enhancing AR features in e-commerce to improve consumer experiences and foster stronger behavioral intentions.

The structural model was further evaluated to explore the relationships between the latent variables—interactivity, mental image, consumer attitudes, and digital behavioral intentions. To assess the significance of the path coefficients and ensure the robustness of the findings, bootstrapping was applied. Bootstrapping, a resampling technique, provides a reliable measure of the stability and significance of the path coefficients, helping to confirm the strength and consistency of the relationships observed. The results of this analysis are summarized in Table 8, offering a clear overview of the statistically significant path coefficients and further strengthening the validity of the study's conclusions. This multi-step evaluation process ensures that the findings are not only theoretically sound but also empirically reliable, offering practical insights for e-commerce businesses seeking to optimize their AR features and enhance consumer engagement.

Table 8
Path Coefficients and Significance

Hypothesized Path	Path Coefficient (β)	t-Value	p-Value	Significance
Interactivity → Mental Image	0.45	7.12	0.000	Significant
Interactivity → Consumer Attitudes	0.38	5.84	0.000	Significant
Mental Image → Consumer Attitudes	0.41	6.03	0.000	Significant
Mental Image → Digital Behavioral Intentions	0.34	4.76	0.000	Significant
Consumer Attitudes → Digital Behavioral Intentions	0.52	8.45	0.000	Significant

Sources: Primary Data, 2024

As shown in Table 8, the structural model analysis reveals several statistically significant relationships between the studied variables. The interactivity of AR features positively influences mental image, with a path coefficient (β) of 0.45, a t-value of 7.12, and a p-value of 0.000, demonstrating a highly significant relationship. Similarly, interactivity has a positive effect on consumer attitudes, indicated by a path coefficient of 0.38, a t-value of 5.84, and a p-value of 0.000, further confirming its statistical significance. Mental image also positively impacts consumer attitudes, with a path coefficient of 0.41, a t-value of 6.03, and a p-value of 0.000, underscoring the significance of this relationship.

Moreover, mental image positively influences digital behavioral intentions, as evidenced by a path coefficient of 0.34, a t-value of 4.76, and a p-value of 0.000, indicating statistical significance. Finally, consumer attitudes exhibit the strongest positive relationship with digital behavioral intentions, with a path coefficient of 0.52, a t-value of 8.45, and a p-value of 0.000, highlighting a highly significant relationship. These findings collectively emphasize the pivotal role of interactivity and mental image in shaping consumer attitudes and driving digital behavioral intentions in e-commerce contexts.

Interactivity → Mental Image

The positive and significant relationship between interactivity and mental image ($\beta = 0.45$, $p < 0.001$) suggests that higher levels of interactivity in AR applications enhance the mental image consumers form about products. This aligns with the assertion that

interactivity is a crucial component of AR technology, allowing users to directly engage with digital content (Arghashi and Yuksel, 2022). When AR applications provide high levels of interactivity, users can manipulate and explore products in a more dynamic and immersive way, leading to clearer and more vivid mental images (Kim, et al. 2023).

Prior research by Park and Yoo (2020) supports this, indicating that interactive AR experiences improve consumers' mental imagery, leading to better product visualization and decision-making. Their findings show that increased interactivity in AR significantly enhances the clarity and vividness of mental images formed by users. The demographic profile of our study, with a significant proportion of students and young professionals, highlights a tech-savvy group that values interactive and engaging digital experiences, further validating this relationship. Thus, higher interactivity in AR applications is crucial for enhancing mental imagery, supporting the hypothesis that interactivity positively influences the mental image consumers form about products.

Interactivity → Consumer Attitudes

The significant positive relationship between interactivity and consumer attitudes ($\beta = 0.38$, $p < 0.001$) indicates that increased interactivity in AR features fosters more favorable consumer attitudes. This finding aligns with the Stimulus-Organism-Response (S-O-R) framework, which posits that interactive stimuli in the environment lead to enhanced cognitive and emotional responses, resulting in positive attitudes (Kim and Lennon, 2013). In the context of AR, interactivity enhances user engagement and satisfaction, leading to more favorable consumer attitudes (Park and Yoo, 2020).

Previous studies have shown that interactive digital experiences significantly influence users' attitudes toward technology and products (McLean & Wilson, 2019), corroborating this result. Given that most respondents are students and full-time workers who are likely accustomed to digital interactions, the importance of interactivity in shaping their attitudes towards AR in e-commerce is further emphasized.

Mental Image → Consumer Attitudes

The positive and significant effect of mental images on consumer attitudes ($\beta = 0.41$, $p < 0.001$) suggests that clearer and more accurate mental images lead to more favorable consumer attitudes. This finding supports the Elaboration Likelihood Model (ELM), which posits that vivid and persuasive mental images can enhance attitudes through central processing (Petty & Cacioppo, 1986). When AR technology facilitates the formation of clear and accurate mental images of products, consumers are likely to develop more positive attitudes towards those products and the e-commerce platform (Yim, et al., 2017).

Research by Park and Yoo (2020) also supports this, indicating that improved mental imagery through AR leads to better consumer evaluations. The demographic profile indicates a preference for detailed product visualization, especially among those frequently purchasing cosmetics and clothing, emphasizing the role of mental imagery in shaping consumer attitudes in e-commerce.

Mental Image → Digital Behavioral Intentions

The positive relationship between mental image and digital behavioral intentions ($\beta = 0.34$, $p < 0.001$) implies that enhanced mental images lead to stronger intentions to engage in digital behaviors, such as purchasing and recommending products. This finding aligns with the Theory of Planned Behavior (TPB), which posits that attitudes and mental representations significantly influence behavioral intentions (Ajzen, 1991). Enhanced

mental images through AR can increase consumers' confidence in their purchase decisions, leading to stronger digital behavioral intentions (Park and Yoo, 2020).

Prior research supports this, showing that effective mental imagery in AR significantly impacts consumers' intentions to purchase and recommend products (Huang & Liao, 2015). Given the high engagement of respondents with AR features, particularly for cosmetics and clothing, the importance of mental images in driving digital behavioral intentions is highlighted.

Consumer Attitudes → Digital Behavioral Intentions

The strongest positive relationship in the model is between consumer attitudes and digital behavioral intentions ($\beta = 0.52$, $p < 0.001$), indicating that positive consumer attitudes significantly enhance their digital behavioral intentions. This finding aligns with the Attitude-Behavior Consistency (ABC) model, which suggests that positive attitudes lead to corresponding behaviors (Fazio, 1990). Favorable consumer attitudes towards AR in e-commerce are expected to result in higher digital behavioral intentions (Uhm, et al., 2022), such as the likelihood to purchase, revisit, and recommend products and services.

Numerous studies have demonstrated that positive attitudes toward technology significantly influence users' behavioral intentions (Venkatesh et al., 2003). The demographic data, with a majority of young, digitally adept consumers, further supports the notion that positive attitudes towards AR significantly influence their behavioral intentions in e-commerce.

Practical Benefits of AR in Digital Marketing Strategies

The practical benefits of AR in digital marketing strategies are numerous and impactful, especially for e-commerce businesses, small and medium-sized enterprises (SMEs), and managerial-level decision-makers in Indonesia. Enhanced customer experience is a key advantage, as AR provides a more engaging and interactive shopping experience. This technology allows customers to visualize products in their own space and make more informed purchase decisions, leading to higher satisfaction and reduced return rates. This aligns with findings that higher levels of interactivity in AR applications enhance the mental image consumers form about products (Arghashi and Yuksel, 2022; Kim et al., 2023). Major companies like IKEA, Amazon, and Sephora have successfully adopted this technology to offer more appealing and satisfying shopping experiences (Tan et al., 2022; Fernando et al., 2024).

AR also increases conversion rates by improving mental imagery and fostering positive attitudes, making customers more likely to purchase products with a clear and accurate visualization (Park and Yoo, 2020). The evolution of marketing towards immersive strategies leverages AR to create engaging consumer experiences (Scholz and Smith, 2016; Tom and Han, 2022). Through AR, companies can deliver personalized and interactive experiences, allowing consumers to engage with brands and products more meaningfully (Hoyer et al., 2020). Additionally, advanced AR features can set a brand apart from its competitors by offering a unique selling proposition that attracts tech-savvy consumers, particularly from the Gen Z demographic, who are accustomed to digital interactions and value engaging experiences (McLean & Wilson, 2019; Firellsya et al., 2024).

Furthermore, positive AR experiences contribute to higher customer retention and loyalty, as satisfied customers are more likely to return for future purchases and recommend the brand to others. This is particularly beneficial for managerial-level decision-makers looking to build long-term customer relationships and sustainable

business growth in Indonesia's diverse market. AR can be effectively integrated into digital marketing campaigns to create immersive and memorable experiences, utilizing social media, email marketing, and online ads to capture consumer attention and drive engagement. This supports the notion that positive consumer attitudes towards AR in e-commerce significantly influence their digital behavioral intentions, leading to higher purchase rates and customer engagement (Uhm et al., 2022; Venkatesh et al., 2003). Understanding how AR technology influences these factors can significantly contribute to optimizing AR use to enhance consumer experience and satisfaction in e-commerce (Fernando et al., 2024).

CONCLUSION AND SUGGESTIONS

This study investigated the impact of Augmented Reality (AR) on digital behavioral intentions in e-commerce, focusing on the relationships between interactivity, mental image, consumer attitudes, and digital behavioral intentions. The results demonstrated that interactivity significantly enhances both mental image and consumer attitudes, which in turn positively influence digital behavioral intentions. Specifically, consumer attitudes showed the strongest effect on digital behavioral intentions, emphasizing the importance of fostering positive consumer attitudes toward AR features. The findings align with established theories and prior research, highlighting the critical role of interactive and immersive AR experiences in shaping consumer behavior.

The practical implications of this research suggest that e-commerce businesses should invest in advanced AR technologies to enhance interactivity and provide detailed, accurate product visualizations. By doing so, companies can improve consumer engagement, satisfaction, and loyalty, ultimately driving higher conversion rates and sales. The study underscores the value of leveraging AR in digital marketing strategies to create unique, memorable shopping experiences that resonate with tech-savvy consumers, particularly those in the Gen Z demographic. Enhancing AR features not only differentiates a brand in a competitive market but also fosters long-term customer relationships and business success.

This study has several limitations that should be acknowledged. The sample size of 120 Gen Z respondents from Indonesia may limit the generalizability of the findings to other demographic groups or regions. Additionally, the study relies on self-reported data, which may be subject to response biases. Future research could expand the sample size and include diverse demographic groups to enhance the generalizability of the results. Longitudinal studies could also be conducted to examine the long-term effects of AR on consumer behavior. Moreover, exploring additional variables such as perceived enjoyment and trust in AR technology could provide deeper insights into the factors influencing digital behavioral intentions in e-commerce.

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