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The Effect of Virtual Try-On on Wardah Product Purchase Decisions among Gen Z in Makassar City with Consumer Satisfaction as an Intervening Factor

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ABSTRACT

This study aims to analyze the effect of Virtual Try-On (VTO) technology on purchase decisions of Wardah products among Generation Z in Makassar City, with consumer satisfaction as an intervening variable. This research is motivated by the rapid development of digital technology, particularly Augmented Reality (AR), which enhances online shopping experiences and reduces consumer uncertainty in purchasing cosmetic products. The research questions focus on whether VTO significantly influences purchase decisions, consumer satisfaction, and whether satisfaction mediates the relationship between VTO and purchase decisions. This study employs a quantitative approach with an explanatory design. Data were collected from 165 respondents using purposive sampling and analyzed using Structural Equation Modeling–Partial Least Square (SEM-PLS). The findings reveal that VTO has a positive and significant effect on purchase decisions and consumer satisfaction. Additionally, consumer satisfaction significantly influences purchase decisions and acts as a mediating variable in the relationship between VTO and purchase decisions. This study contributes to the literature on digital marketing and consumer behavior by highlighting the importance of interactive technology in enhancing customer experience and influencing purchasing behavior in the cosmetics industry.

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Introduction

The development of digital technology has brought significant changes to the mindset and lifestyle of Indonesian society. Digitalization has now become the main driver of business growth, especially through digital marketing and e-commerce, which expand market reach, increase efficiency, and support business competitiveness at the global level Ain et al., (2024). This transformation not only affects the way people communicate and obtain information, but

also changes consumption behavior. Society is increasingly accustomed to carrying out daily activities, ranging from shopping for basic needs, paying bills, to purchasing lifestyle products, all with digital devices quickly, conveniently, and efficiently.

The rapid growth of e-commerce in Indonesia has driven the presence of technological innovations that enrich the consumer shopping experience. In 2023, Indonesia's digital economy reached 82 billion US dollars, with the e-commerce sector as the largest contributor. Temasek, (2023). One of the innovations that is increasingly prominent is the use of Augmented Reality (AR) technology, which allows consumers to try products virtually before making a purchase, such as in the categories of cosmetics, clothing, or furniture. This AR technology not only provides a more interactive and immersive shopping experience but also reduces consumer uncertainty in decision-making.

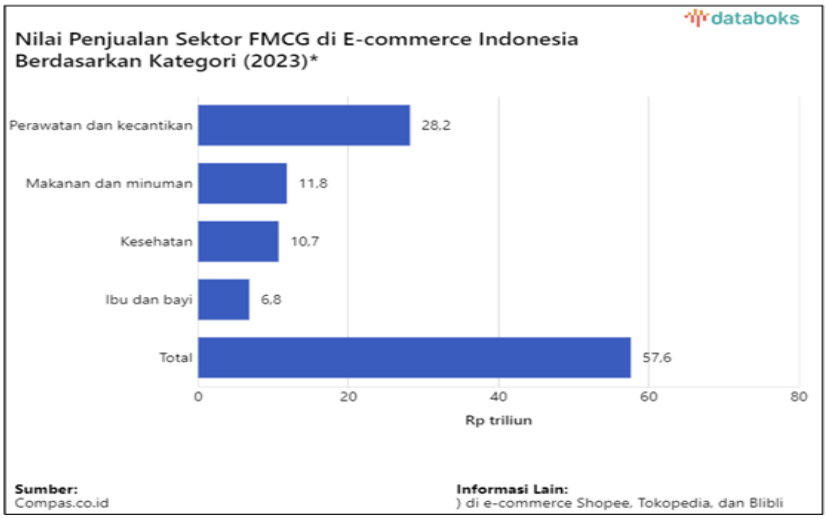

Figure 1. FMCG Sector Sales Value in E-Commerce in Indonesia
Source : Data Processed, 2026

This change is felt strongly in the Fast Moving Consumer Goods (FMCG) sector, especially beauty and personal care products. Mutia, (2023) noting that in the period of January–December 2023, the sales value of beauty products on Indonesian e-commerce reached IDR 28.2 trillion or around 49% of total FMCG sales. This fact shows that cosmetics have become an important part of daily needs, not only for appearance but also as a representation of oneself in the digital space.

The Indonesian cosmetics market shows significant growth with an increase of up to 48%, which opens up great opportunities for small and medium industries to innovate and compete with big brands in both local and global markets Indonesia, (2023). This growth is driven by increasing community income, e-commerce expansion, and the increasingly strong influence of social media in shaping consumer behavior. Although the market faces challenges in the form of strict regulations and high raw material costs, significant opportunities remain open for natural products, personalization, and sustainable cosmetic trends. Research, (2023).

However, amid the rapid development of digital technology and the increasing online shopping activities, a fundamental issue arises regarding the level of consumer trust in online transactions. Based on the survey results Kompas, (2023) states that 59.5% of Indonesian consumers still doubt the quality of products purchased online, and 43.4% of consumers are concerned about the risk of fraud in e-commerce transactions. This condition shows that consumer trust still remains a major obstacle in the decision-making process of purchasing cosmetic products online. Thus, although the Indonesian cosmetic market presents significant growth opportunities, the main challenge faced by industry players lies in how to build consumer trust and confidence in shopping for beauty products through digital platforms.

On the other hand, competition between local and global brands in Indonesia is becoming increasingly fierce. Global brands like Maybelline dominate sales with a value reaching 21.4% during the period of December 6-13, 2021, far ahead of local brands like Wardah, which are in lower positions Compas, (2021). This dominance is reinforced by the power of technological innovation, a wide range of products, as well as the global distribution network owned by Maybelline. Meanwhile, local brands such as Wardah, Make Over, Scarlett, and Somethinc continue to show rapid growth thanks to strategies that are relevant to the needs of local consumers Goodstats, (2024).

Changes in consumer behavior and technological advancements demand cosmetic brands to continuously innovate, especially in the digitalization of consumer experiences. Virtual Try-On (VTO) is one of the important innovations that can provide a more personal and interactive shopping experience, increasing consumer confidence in making online transactions. Local brands need to strengthen this technology to compete with the technological advantages of global brands and expand their market share in the digital realm. In addition, product innovations that are relevant to local needs and halal certification become important competitive advantages for local brands. Dreamlab, (2025)

As one of the largest local brands, Wardah is required to continue innovating in order to compete with both global and local brands, especially global brands like Maybelline that have adopted advanced digital technology. Wardah, as the largest halal brand in Indonesia, is faced with the challenge of continuously innovating to maintain and improve its performance. Although a halal image is a significant competitive advantage, Wardah has successfully entered the top 3 best-selling cosmetics brands in Southeast Asia. Goodstats, (2025). Those advantages are not enough to guarantee overall market dominance.

Data shows that Maybelline excels in the digital category with technology penetration such as Virtual Try-On (VTO) and has a strong market share in certain categories, such as lipstick products on e-commerce with a market share of up to around 18.6%, compared to Wardah at around 12.7%. In addition, Wardah in Q1 2025 had a market share of around 2.97% in the care and beauty category on Shopee, while other brands like Skintific were at the top with 4.10%.Markethac, (2025). This shows that although Wardah has the advantage of halal values, the integration of digital technology innovation and strong marketing strategies becomes a primary need to be able to compete effectively with both global and local brands.

One of the strategic steps taken is the implementation of Virtual Try-On (VTO) technology based on Augmented Reality (AR) since 2020 News, (2020). This technology

allows consumers to try cosmetic products such as lipstick, foundation, and cushion virtually through a camera or photo. This innovation not only provides a more interactive shopping experience but also offers a hygienic and environmentally friendly solution by reducing the need for physical testers. Wardah's implementation of Virtual Try-On (VTO) recorded more than 250 thousand usage sessions, increased website traffic by 134.41%, and recorded an engagement rate of up to 28.79% in the first year of its launch. Corp, (2021). The success of this VTO implementation shows that digital technology can be a catalyst in strengthening consumer loyalty and purchasing decisions. In addition, the Virtual Try-On (VTO) feature allows Wardah to gain deep insights into user preferences through interaction data, so that marketing strategies can be designed more accurately and relevantly.

Figure 2. Example of Using Wardah's Virtual Try-On (VTO) Feature
Source: Wardahbeuty.com (2020), *Data Processed, 2026*

The image shows the Wardah Virtual Try-On (VTO) feature, which allows consumers to try makeup virtually. The model's face is displayed split into two: the left side without makeup, the right side with the virtual application result. Below it are lipstick shade options 01–08, with shade 03 selected. Promotional text explains the support of Advanced Beauty Match technology, as well as an interactive button “Get The Look Here” to try it directly on the Wardah website. This feature offers an interactive digital shopping experience without the need for physical testers. Wardah's implementation of the Virtual Try-On (VTO) feature is a strategic step to overcome consumer doubts in online cosmetic shopping, especially regarding the suitability of product colors with their skin. Through this innovation, Wardah successfully provides a more personal and enjoyable shopping experience for consumers. The VTO feature also strengthens the brand’s image as a pioneer in halal beauty that is adaptive to technological developments. VTO also encourages conversion purchases because consumers feel more confident about the product choices they make.

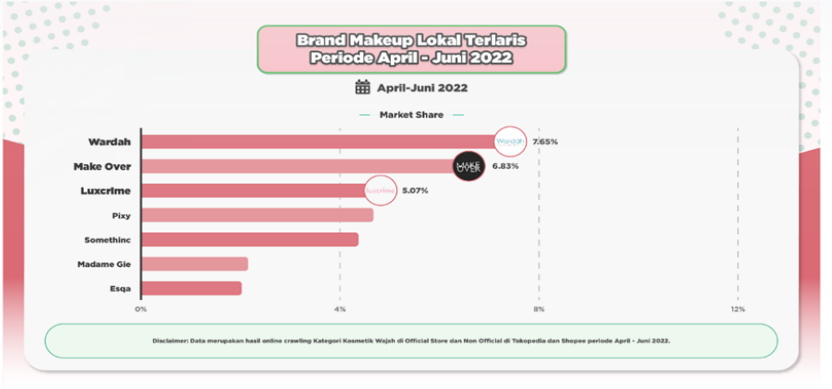

Figure 3. Best-selling Local Brands for the April-June 2022 Period
Source: Compas.co.id, (2022) *ata Processed, 2026*

Based on the graph, it shows data on the best-selling local makeup brands in Indonesia for the period of April-June 2022, measured by market share on e-commerce platforms. Wardah managed to secure the first position with a market share of 7.65%, making it the best-selling local cosmetic brand during that period. The second position was held by Make Over with a market share of 6.83%, only 0.82% behind Wardah, reflecting very tight competition between the two. In third place is Luxcrime with a market share of 5.07%, followed by Pixy and Somethinc, which have relatively balanced shares, around 4–5%. Meanwhile, Madame Gie and Esqa occupy the bottom positions with a market share below 4%, indicating that there is still a gap in market dominance between large brands and smaller brands in the local cosmetics industry. Compas, (2022). This achievement demonstrates Wardah's dominance in the local cosmetics market, which is inseparable from its halal image, product innovation, and marketing strategies that adapt to technological developments.

The implementation of Virtual Try-On (VTO) technology by Wardah since 2020 has had a varied impact on the sales performance of its different product categories. According to Top Brand Index data, the lipstick category recorded an impressive recovery trend, with market share increasing from 31.90% in 2020 to 33.50% in 2021, even surpassing the performance before the Virtual Try-On (VTO) technology was integrated into its digital platform. Index, (2025).

Gambar 4. Top *Brand* Lokal Lipstik
Sumber: Compas.com, (2024) *Data Processed, 2026*

Based on the Compas Market Insight Dashboard report (2024), Wardah is recorded as the local lipstick brand with the largest market share in Indonesia, at 10.6% in the period of April 2024. Wardah's success in dominating the lipstick market is inseparable from its strong brand image as a pioneer of halal cosmetics as well as its digital marketing strategy that is adaptive to young consumer behavior, especially Generation Z and Millennials. Make Over occupies the second position with a market share of 6.9%, followed by Hanasui (5.4%), Oh My Glam (4.9%), and Madame Gie (4.3%). This data shows that although competition is increasingly tight in the local cosmetics market, Wardah is still able to maintain a dominant position. This advantage is supported not only by product quality and brand consistency, but also by technological innovations such as the implementation of the Virtual Try-On (VTO) feature, which increasingly facilitates consumers in determining product choices. Compas, (2024).

Table 1. Top Brand Index for loose powder and compact powder category in 2023–2024

No	Tahun	Jenis Bedak	TOP 3 Brand
1.	2023	Bedak Tabur.	Wardah (19.30%)
			Marck (17.70%)
			Make Over (11.20%)
		Bedak Padat.	Wardah (23.60%)
			Make Over (11.30%)
			Pixy (8.10%)
2.	2024	Bedak Tabur.	Wardah (19.70%)
			Marcks (15.70%)
			Make Over (11.70%)
		Bedak Padat.	Wardah (25.60%)
			Make Over (11.70%)
			Maybelline (6.80%)

Source: Top Brand Indeks, 2025. Data Processed, 2026

Based on the 2023–2024 Top Brand Index data, Wardah shows consistent dominance as the largest cosmetic brand in Indonesia for the loose powder and compact powder categories, with market share increasing from 19.30% to 19.70% for loose powder and from

23.60% to 25.60% for compact powder. The second and third positions are occupied by Make Over and the global brand Maybelline Index, (2025). Wardah's success in maintaining this position is influenced by a combination of differentiation strategies based on halal products and the implementation of digital innovations, making it a significant challenge for both local and global brands in the Indonesian cosmetics industry.

Based on the results of the 2020 Population Census released by the Central Statistics Agency (BPS), Generation Z (born between 1997–2012) is recorded as the largest population group in Indonesia in the age range of 13 to 28 years Mudjiyanto et al., (2025). The number reaches around 74.93 million people, or equivalent to 27.94 percent of the total national population Goodstats, (2023). This fact shows that Gen Z has a strategic role in shaping social, economic, and consumption trends in Indonesia, including in the use of digital technology as well as online shopping behavior. The large number of Gen Z also becomes a great opportunity for business actors to adjust marketing strategies, especially through digital platforms that match the characteristics of a generation known to be adaptive, critical, and familiar with technology.

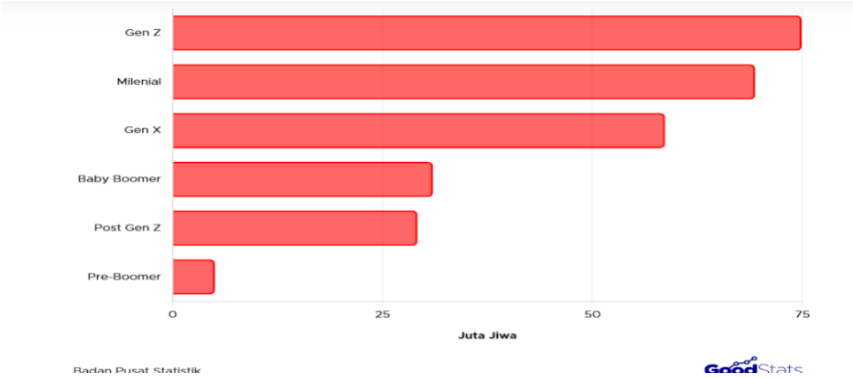

Figure 5. Indonesia is Dominated by Gen Z
Source: Goodstats.id. (2023)

Makassar City, as the capital of South Sulawesi Province, is one of the metropolitan cities with a dominant young generation. According to the Makassar City Regional Statistics 2024 data, as many as 26.1 percent of the population or around 384,844 people are aged 15–29 years, which can be categorized as Generation Z. This figure underscores the important role of Gen Z in the city's demographic structure while also showing Makassar's great potential as a strategic market for various modern lifestyle-based sectors, including the digital economy, cosmetic products, and the creative industry Statistik, (2024).

Katadata, (2024) noting that cosmetic products have become one of the most frequently purchased categories online by Gen Z in Indonesia. In this context, Wardah, as one of the leading local cosmetic brands, has successfully built an image as a halal, modern, educational, and empowering brand for women, thus being able to attract the attention of young consumers. Research Azhari, (2025) It shows that among Gen Z women in Makassar, digital marketing strategies, brand image, and market segmentation have a significant influence on customer satisfaction, with segmentation being the dominant factor (regression coefficient 0.400). This finding indicates that Gen Z in Makassar is highly responsive to

digital marketing and product personalization strategies, so innovative technologies such as Virtual Try-On (VTO) have great potential to increase consumer satisfaction and drive purchasing decisions for Wardah cosmetic products.

Several studies indicate that Virtual Try-On (VTO) technology can increase consumer satisfaction because it provides an interactive and realistic visual experience. Research Gaudich, (2024) finding that VTO technology helps female consumers in assessing product fit before purchasing. It reduces the risk of post-purchase dissatisfaction, and ultimately strengthens loyalty and purchase decisions. This proves that VTO is not just a technological innovation, but an emotional strategy to enhance customer satisfaction. In addition, the research Chen et al., (2024) found that VTO has a significant influence on satisfaction and purchase decisions by increasing satisfaction through its ability to display product visuals realistically, helping consumers assess fit, and reducing uncertainty before buying. In addition, aspects of enjoyment and ease of use also shape positive attitudes toward fashion products.

Next, according to Wirvani et al., (2024), The quality of digital experience through e-service quality has been proven to have a very strong influence on consumer satisfaction, which then encourages the occurrence of repurchase intention. Consumer satisfaction plays an important role in strengthening and explaining how a good digital experience can result in actual purchasing behavior. In line with that, research Sunarya, (2024), shows that consumer satisfaction plays a role in bridging the relationship between online experience and customer loyalty on Bukalapak e-commerce, which asserts that digital experience alone is not enough to shape loyal behavior, but rather that experience must first generate satisfaction in order to develop into customer commitment and loyalty.

Method

This study employs a quantitative approach with an explanatory research design aimed at examining the causal relationships between Virtual Try-On (VTO), consumer satisfaction, and purchase decisions. This approach is chosen because it enables the empirical testing of relationships among variables through hypothesis testing.

The population of this study consists of Generation Z consumers in Makassar City who use Wardah products. The sampling technique applied is probability sampling using a simple random sampling method, Where the sampling technique from the population is carried out randomly without paying attention to the strata in the population..

Data collection was conducted through the distribution of questionnaires, both directly and online. The research instrument utilized a Likert scale ranging from 1 to 5 (Malhotra, 2019) to measure respondents' perceptions of the research variables, namely Virtual Try-On (VTO), consumer satisfaction, and purchase decisions.

The data analysis technique employed in this study is Structural Equation Modeling based on Partial Least Square (SEM-PLS) using SmartPLS software. The analysis includes evaluation of both the measurement model (outer model) and the structural model (inner model) in accordance with standard SEM-PLS procedures commonly used in quantitative research.

The results of the measurement model evaluation indicate that all constructs meet the criteria of validity and reliability, meaning that the research instrument is appropriate for use. This is evidenced by indicator values that exceed the required minimum thresholds and demonstrate strong internal consistency across all variables.

The research model illustrates the relationship between Virtual Try-On (VTO) as the independent variable, consumer satisfaction as the mediating variable, and purchase decisions as the dependent variable. VTO is represented as variable X, which influences both consumer satisfaction (Z) and purchase decisions (Y). Furthermore, consumer satisfaction (Z) acts as an intervening variable that mediates the effect of VTO (X) on purchase decisions (Y), both directly and indirectly.

Results and Discussion

This research was conducted on Generation Z in the city of Makassar to determine the Level of Purchase Decision for Wardah products. Data collection was carried out through the distribution of questionnaires both directly and online with the criteria (1) respondents residing in Makassar City (2) aged 13-28 years (3) have ever used the Virtual Try-On (VTO) feature, especially for Wardah cosmetic products.

The research instrument went through a pretest stage before being used in the main data collection. The collected data were analyzed using the Partial Least Squares-based Structural Equation Modeling (PLS-SEM) method with the assistance of SmartPLS 4.0.**Evaluasi Model Measurement (Outer Model)**

Convergent Validity Test

Table 2. Loading Factor

Indikator	Virtual Try On (X)	Keputusan Pembelian (Y)	Kepuasan Konsumen (Z)
X.1	**0.888**		
X.10	**0.828**		
X.11	**0.897**		
X.12	**0.867**		
X.2	**0.907**		
X.3	**0.868**		
X.4	**0.720**		
X.5	**0.811**		
X.6	**0.875**		
X.7	**0.868**		
X.8	**0.853**		
X.9	**0.835**		
Y.1		**0.820**	
Y.10		**0.795**	
Y.11		**0.829**	

Y.12		0.865	
Y.2		0.874	
Y.3		0.787	
Y.4		0.805	
Y.5		0.768	
Y.6		0.853	
Y.7		0.856	
Y.8		0.795	
Y.9		0.814	
Z.1			0.784
Z.2			0.862
Z.3			0.835
Z.4			0.816
Z.5			0.799
Z.6			0.818
Z.7			0.831
Z.8			0.850
Z.9			0.871

Source: Processed by the researcher (2026)

Based on the table above, after eliminating indicators that did not meet the criteria, all indicators eventually fulfilled the convergent validity requirements. Then, a convergent validity analysis was conducted through the testing of the average variance extracted (AVE). The AVE test aims to assess the extent to which indicators within a construct are able to explain the variance they possess. A construct is considered to meet the convergent validity criteria if the AVE value obtained is greater than 0.50.(Ghozali & Latan, 2020).

Tabel 3. Average Variance Extracted (AVE) Value

Variabel	*Average variance extracted* (AVE)
Virtual Try On (X)	0.727
Keputusan Pembelian (Y)	0.676
Kepuasan Konsumen (Z)	0.689

Source: Processed by the researcher (2026)

Dalam data pada tabel diatas seluruh nilai AVE tersebut lebih besar dari 0,50 (Ghozali & Latan, 2020), yang menunjukkan bahwa proporsi varians indikator yang dapat dijelaskan oleh konstruk lebih tinggi dibandingkan dengan varians kesalahan pengukuran. Dengan demikian, hasil ini mengindikasikan bahwa setiap konstruk dalam penelitian ini memenuhi kriteria validitas konvergen, dan seluruh indikator yang tersisa telah mampu merepresentasikan variabel laten secara konsisten dan akurat.

Uji Validitas Diskriminan

Table 4. Cross Loading Score Results

Indikator	*Virtual Try On* (X)	Keputusan Pembelian (Y)	Kepuasan Konsumen (Z)
X.1	**0.888**	0.753	0.545
X.10	**0.828**	0.742	0.522
X.11	**0.897**	0.784	0.551
X.12	**0.867**	0.747	0.566
X.2	**0.907**	0.804	0.623
X.3	**0.868**	0.752	0.582
X.4	**0.720**	0.546	0.384
X.5	**0.811**	0.688	0.493
X.6	**0.875**	0.761	0.543
X.7	**0.868**	0.731	0.556
X.8	**0.853**	0.770	0.538
X.9	**0.835**	0.731	0.521
Y.1	0.729	**0.820**	0.697
Y.10	0.701	**0.795**	0.667
Y.11	0.685	**0.829**	0.712
Y.12	0.747	**0.865**	0.722
Y.2	0.763	**0.874**	0.772
Y.3	0.680	**0.787**	0.690
Y.4	0.677	**0.805**	0.660
Y.5	0.677	**0.768**	0.637
Y.6	0.739	**0.853**	0.702
Y.7	0.737	**0.856**	0.720
Y.8	0.684	**0.795**	0.668
Y.9	0.703	**0.814**	0.686
Z.1	0.510	0.634	**0.784**
Z.2	0.577	0.744	**0.862**
Z.3	0.524	0.676	**0.835**
Z.4	0.533	0.687	**0.816**
Z.5	0.512	0.688	**0.799**
Z.6	0.475	0.680	**0.818**
Z.7	0.532	0.723	**0.831**
Z.8	0.544	0.755	**0.850**
Z.9	0.502	0.717	**0.871**

Source: Processed by the researcher (2026)

Based on the results of the cross-loading test in the table above, it can be seen that all indicators have the highest loading values on the construct being measured compared to other

constructs. The indicators in the Virtual Try On (X) variable consistently show the highest loading values on construct X, compared to constructs Y and Z. Likewise, the indicators in the Purchase Decision (Y) variable have the highest loading values on construct Y, and the indicators in the Customer Satisfaction (Z) variable show the largest loading values on construct Z. This indicates that each indicator is able to represent its respective variable well, so it can be said that the model has met the discriminant validity criteria.

Table 6. HTMT Ratio

Variabel	*Virtual Try On* (X)	Keputusan Pembelian (Y)	Kepuasan Konsumen (Z)
Virtual Try On (X)			
Keputusan Pembelian (Y)	**0.897**		
Kepuasan Konsumen (Z)	**0.658**	**0.889**	

Source: Processed by the researcher (2026)

Hasil pengujian *discriminant validity* menggunakan HTMT, diperoleh bahwa seluruh nilai HTMT antar konstruk berada di bawah batas maksimum yang direkomendasikan, yaitu < 0,90 (Ghozali & Latan, 2020).

Construct Reliability Test

Table 7. Composite Reliability (CR) Score Results

Variabel	*Composite Reliability*
Virtual Try-On (X)	**0,970**
Keputusan Pembelian (Y)	**0,962**
Kepuasan Konsujmen(Z)	**0,952**

Source: Processed by the researcher (2026)

Based on the results listed in Table 6, the composite reliability values for each variable are greater than 0.70. This indicates that all variables in this study have met the criteria for good reliability and can therefore be considered to have passed the reliability test. Based on the test results, a composite reliability value exceeding 0.70 indicates that the measured construct is consistent and reliable. (Abdillah & Hartono, 2015).

Table 8. Results of Cronbach's Alpha Values

Variabel	*Cronbach's Alpha*
Virtual Try-On (X)	**0,966**
Keputusan Pembelian (Y)	**0,956**
Kepuasan Konsujmen(Z)	**0,943**

Source: Processed by the researcher (2026)

Based on the results in the table, the Cronbach's alpha values for each variable show numbers greater than 0.60 (> 0.60). This indicates that all variables in the study have met the criteria for good reliability and are suitable for further testing. Reliability testing with Cronbach's alpha is used to assess the homogeneity among indicators within a single construct, or the extent to which these indicators are related in measuring the same concept. (Abdillah &

Hartono, 2015). Thus, the higher the value of Cronbach's alpha, the higher the level of reliability or internal consistency of the measured construct.

Table 9. Model Fit Score Results

	Saturated model	*Estimated model*
SRMR	0.050	0.050
d_ULS	1.391	1.391
d_G	1.511	1.511
Chi-square	1292.296	1292.296
NFI	0.793	0.793

Source: Processed by the researcher (2026)

Based on the model fit evaluation results in the table above, the Standardized Root Mean Square Residual (SRMR) value obtained is 0.050 for both the saturated model and the estimated model. This value is below the 0.08 threshold, indicating that the model has a good fit with the data. A low SRMR value indicates that the difference between the observed correlations and those predicted by the model is very small. In addition, the Normed Fit Index (NFI) value of 0.793 indicates that the model fit level is in the fairly good category. Other values such as d_ULS (1.391), d_G (1.511), and chi-square (1292.296) also show consistent results between the saturated model and the estimated model. Therefore, this research model meets the overall goodness-of-fit criteria and can be deemed appropriate for use in testing relationships between variables. (Hair dkk., 2022).

Structural Model Analysis (Inner Model)

Table 10. R-Square Value Results

Variabel	***R-square***	***R-square adjusted***
Keputusan Pembelian (Y)	**0.896**	0.895
Kepuasan Konsumen (Z)	0.399	**0.395**

Source: Processed by the researcher (2026)

Based on the results in Table 10, it is known that the R-Square value for the Purchase Decision variable (Y) is 0.896 with an Adjusted R-Square of 0.895. This indicates that 89.5% of the variation in purchase decisions can be explained by the variables in the research model, while the remaining 10.5% is influenced by variables outside the model. Furthermore, the R-Square value for the Consumer Satisfaction variable (Z) is 0.399 with an Adjusted R-Square of 0.395. This means that 39.5% of the variation in consumer satisfaction can be explained by the variables in the model, while the remaining 60.5% is influenced by other factors outside the study. These results show that the model has very good explanatory power for the purchase decision variable and fairly good explanatory power for the consumer satisfaction variable.

Table 11. Q-Square (Q^2) Value Results

Variabel	***Q^2predict***
Keputusan Pembelian (Y)	0.740
Kepuasan Konsumen (Z)	0.378

Source: Processed by the researcher (2026)

Based on the Q-Square (Q^2) value results, it is known that the Purchase Decision (Y) variable has a value of 0.740, while the Consumer Satisfaction (Z) variable has a value of 0.378. Referring to the criteria put forward by Hair dkk., (2022). Q^2 value > 0.35 indicates that the model has strong predictive capability. Thus, these two endogenous variables show that the research model has strong predictive relevance in predicting purchasing decisions and consumer satisfaction.

Hypothesis Testing Results

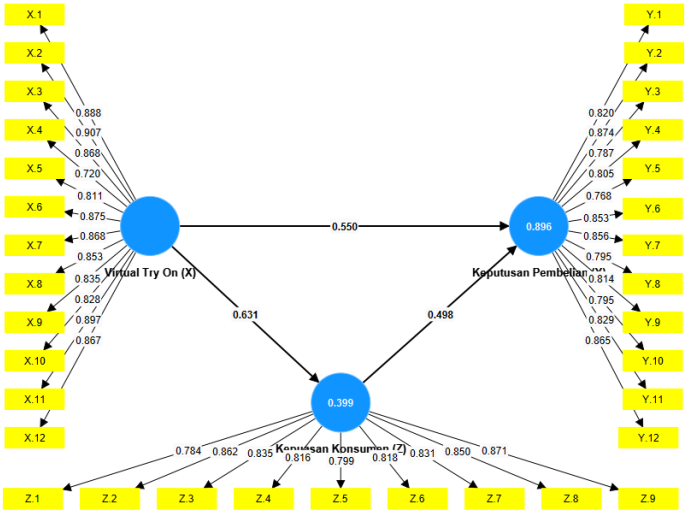

Figure 6 Research Model Results

Source: Processed by the researcher (2026)

Based on Figure 6 above, hypothesis testing in this study was conducted by taking into account the t-statistic and p-value obtained through the bootstrapping procedure in SEM-PLS analysis. The decision-making criteria are based on the significance standard, where a relationship is considered significant if the t-statistic value ≥ 1.645 at a 5 percent significance level (one-tailed test) or p-value < 0.05 (Michella & Meilani, 2023). Thus, if the test results meet both of these criteria, the hypothesis is declared accepted, which means there is a significant effect between the tested variables. Conversely, if it does not meet these limits, the hypothesis is rejected.

Table 12. Direct Effect Test Results

Variabel	*Original sample (O)*	*Sample mean (M)*	*Standard deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P values*
X -> Y	**0.550**	0.549	0.064	**8.637**	**0.000**
X -> Z	**0.631**	0.632	0.078	**8.113**	**0.000**
Z -> Y	**0.498**	0.499	0.061	**8.120**	**0.000**

Source: Processed by the researcher (2026)

Based on the results of the direct effect testing in Table 12, all hypotheses in this study were accepted. Virtual Try-On (VTO) was proven to have a positive and significant effect on

Purchase Decisions with an original sample value of 0.550, t-statistic of 8.637, and p-value of 0.000 (< 0.05). In addition, Virtual Try-On also has a positive and significant effect on Customer Satisfaction with an original sample value of 0.63, t-statistic of 8.113, and p-value of 0.000 (< 0.05). Furthermore, Customer Satisfaction shows a positive and significant effect on Purchase Decisions with an original sample value of 0.498, t-statistic of 8.120, and p-value of 0.000 (< 0.05). These results indicate that the better Virtual Try-On and Consumer satisfaction, then the higher the Purchase decision towards Wardah cosmetic products.

Table 13. Results of Indirect Effect

Variabel	*Original sample (O)*	*Sample mean (M)*	*Standard deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P values*
X -> Z -> Y	**0.315**	0.316	0.058	**5.450**	**0.000**

Source: Processed by the researcher (2026)

Based on the test results in the table, it shows that Virtual Try-On (VTO) has been proven to be positive and significant on Purchase Decisions through Consumer Satisfaction as an intervening variable, with an original sample value of 0.315, t-statistic of 5.450, and p-value of 0.000 (< 0.05). In addition, the direct effect of VTO on consumer satisfaction has a t-statistic value of 8.637 (> 1.645) and a p-value of 0.000 (< 0.05). This indicates that Virtual Try-On not only indirectly affects Consumer Decisions through consumer satisfaction, but also has a direct effect on purchase decisions.

Table 14. Total Effect Results

Variabel	*Original sample (O)*	*Sample mean (M)*	*Standard deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P values*
X -> Y	**0.864**	0.865	0.030	**28.827**	**0.000**
X -> Z	**0.631**	0.632	0.078	**8.113**	**0.000**
Z -> Y	**0.498**	0.499	0.061	**8.120**	**0.000**

Source: Processed by the researcher (2026)

Based on Table 14 above, the results of the total effect testing, which include the combination of direct effects and indirect effects, show that all relationships between variables in the research model have a positive and significant influence. This indicates that both direct effects and those through intervening variables contribute meaningfully to the relationships between the constructs being tested.

Furthermore, the following presents a summary of the hypothesis results that have been conducted in this study. This table provides a comprehensive overview of the relationships between the variables examined, namely Virtual Try-On (VTO), Purchase Decision, and Customer Satisfaction. In addition to showing the direction of influence between variables, the table also indicates the significance level of each relationship, making it easier for readers to understand the strength of each variable's influence on customer satisfaction.

Table 15. Hypothesis Test Results

Variabel	*Original Sample (O)*	*T-Statistic*	*P-Values*	Keterangan	Hasil
X – Y	0.550	8.637	0.000	Positif & Signifikan	Diterima
X – Z	0.631	8.113	0.000	Positif & Signifikan	Diterima
Z – Y	0.498	8.120	0.000	Positif & Signifikan	Diterima
X – Z – Y	0.315	5.450	0.000	Positif & Signifikan	Diterima

Source: Processed by the researcher (2026)

Based on the table of hypothesis testing results, it can be concluded that all hypotheses in this study are declared accepted.

Discussion

The Influence of Virtual Try-On (VTO) on Purchase Decisions

Based on the analysis results, the relationship between the Virtual Try-On (VTO) variable has a positive and significant effect on the purchasing decisions of Wardah products among Generation Z in Makassar City. This is proven by a coefficient value of 0.550, a T-statistic value of 8.637 (> 1.96), and a P-value of 0.000 (< 0.05). This indicates that the better and more attractive the Virtual Try-On feature used, the more it will increase consumers' purchasing decisions. This feature provides an interactive experience that can help consumers evaluate products before buying. These findings are in line with research by Chen et al. (2024) finding that the use of Virtual Try-On consistently has a positive impact on consumer satisfaction, purchase intention, and even purchase decisions. In addition, research by Thalita et al. (2024) also shows that the utilization of Augmented Reality-based Virtual Try-On features has a positive and significant effect on product selection, which becomes an important part of the consumer purchase decision process. This confirms that Virtual Try-On is an effective digital technology in helping consumers make purchase decisions more confidently and informed, especially in the context of Wardah cosmetic products.

The Influence of Virtual Try-On (VTO) on Consumer Satisfaction

Based on the data analysis results, it is known that Virtual Try-On (VTO) has a positive and significant effect on consumer satisfaction. This is indicated by a coefficient value of 0.631, a T-statistic of 8.113, and a P-value of 0.000. This means that the use of Virtual Try-On technology can increase the level of consumer satisfaction because it provides convenience, comfort, and a more realistic virtual product try-on experience. This research finding aligns with the study by Wahyudin and Aksari (2024), which found that the use of Augmented Reality Virtual Try-On has a significant effect on perceived enjoyment, reflecting consumers' feelings of pleasure and satisfaction in using the technology. This finding is reinforced by Chen et al.

(2024), who stated that VTO can enhance consumer satisfaction through realistic product visual presentation, ease of use, and its ability to help consumers evaluate product fit before purchasing. Thus, the better the quality and experience provided by the Virtual Try-On feature, the higher the level of consumer satisfaction that is formed.

The Influence of Customer Satisfaction on Purchase Decisions

Based on the results of hypothesis testing using the SEM-PLS method, it was found that consumer satisfaction has a positive and significant effect on the purchasing decisions of Wardah Gen Z cosmetic products in Makassar City. With a coefficient value of 0.498, a T-statistic of 8.120, and a P-value of 0.000. This research result is in line with studies by Rizki and Rizki & Santoso, (2023) and Hun et al., (2023) which found that consumer satisfaction has a significant influence on purchasing decisions, where positive experiences in the digital transaction process are able to increase confidence and reduce consumer hesitation in buying products. In addition, research by Wirvani et al. (2024) also shows that consumer satisfaction formed from the quality of digital experiences plays an important role in encouraging repurchase behavior, reflecting sustainable purchasing decisions. Thus, various previous research results confirm that consumer satisfaction is an important factor that influences purchasing decisions, as it is able to strengthen consumers' beliefs, trust, and tendency to make actual purchases.

The Influence of Virtual Try-On (VTO) on Purchase Decisions through Consumer Satisfaction.

Based on the indirect effect results, it is known that Virtual Try-On (VTO) has a positive and significant effect on purchase decisions through consumer satisfaction as an intervening variable. This is shown by a coefficient value of 0.315, a T-statistic of 5.450, and a P-value of 0.000. Several previous studies show results that are in line with the findings of this study, that consumer satisfaction plays a role as an intervening variable in the relationship between Virtual Try-On (VTO) and purchase decisions. Research by Chen et al. (2024) revealed that the influence of Virtual Try-On on purchase decisions occurs not only directly but also through the increase in consumer satisfaction formed from realistic and interactive visual experiences. In addition, research by Micheletto et al., (2025) shows that enjoyable experiences, ease of use, and the information provided by the VTO feature are able to increase consumer satisfaction, which then encouraging the intention and decision to purchase cosmetic products. Thus, various previous research results clarify that customer satisfaction plays a strategic role as a mediator connecting the experience of using Virtual Try-On with the actual consumer purchase decision.

Conclusion

Based on the research results, it can be concluded that Virtual Try-On (VTO) and Purchase Decisions are proven to have a positive and significant influence on consumer satisfaction. VTO not only directly affects consumer decisions, but also indirectly through consumer satisfaction as an intervening variable. Consumer satisfaction is also proven to play

a role in enhancing purchase decisions, as well as serving as a partial mediator in the relationship between VTO and purchase decisions. These findings indicate that the use of interactive visual technology can provide a better experience for consumers, shape positive perceptions, and encourage increased purchase decisions, which ultimately impact consumer satisfaction. However, the results of this study are limited to certain respondent characteristics, so generalization of the findings should be done carefully.

Based on these conclusions, it is recommended that companies further optimize the use of Virtual Try-On technology by providing features that are engaging, accurate, and easy to use in order to enhance consumer experience, encourage purchasing decisions, and increase consumer satisfaction. In addition, this study has limitations in terms of the sample scope, which only includes certain respondent groups, and the variables studied are still limited. Therefore, future research is recommended to expand the research objects, increase the number and variety of respondents, and consider other relevant variables in order to provide more comprehensive results.

References

Abdillah, W., & Hartono, J. (2015). *Partial least square (PLS): Alternatif structural equation modeling (SEM) dalam penelitian bisnis.*

Ain, N., Safitri, D. N., & Hendra, J. (2024). Pemasaran Digital dan E-Commerce di Era Globalisasi: Tren, Inovasi, dan Dampaknya pada Bisnis Global. *Journal of Education Transportation and Business*, *1*(2), 753–763. https://doi.org/10.57235/jetbus.v1i2.4380

Annur, C. M. (n.d.). *Perawatan dan Kecantikan, Kategori FMCG Terlaris di E-commerce RI 2023*. Databoks 2023, Databoks. https://databoks.katadata.co.id/produk-konsumen/statistik/9cd91b0953919bd/perawatan-dan-kecantikan-kategori-fmcg-terlaris-di-e-commerce-ri-2023

Antara News. (2020). *Perfect Corp. dan Paragon hadirkan pengalaman virtual AR kepada pembelanja di Indonesia*. \. https://www.antaranews.com/berita/1807321/perfect-corp-dan-paragon-hadirkan-pengalaman-virtual-ar-kepada-pembelanja-di-indonesia

Azlan Azhari. (2025). Mengoptimalkan Kepuasan Pelanggan Melalui Peran Digitalmarketing, Brand Image, Dan Segmentasi Pelanggan. *Jurnal Ilmu Manajmen, Bisnis Dan Ekonomi*, *2*, *No. 6*.

Chen, C., Ni, J., & Zhang, P. (2024). *Virtual Try-On Systems in Fashion Consumption:A Systematic Review*.

compas.co.id. (2024). *Compas Market Insight Dashboard: Brand Wardah Pimpin Top 10 Brand Lokal Kategori Lipstik dengan Market Share Tertinggi, 10,6% di E-commerce*. https://compas.co.id/article/market-insight-brand-wardah-pimpin-top-brand-lokal-kategori-lipstik/

Compas. (2021). *Penjualan Wardah*. https://www.instagram.com/compas.co.id/

Corp, P. (2021). *Wardah Reports 134.41% Increase in Web Traffic Since Integrating Virtual Makeup Try-On and Foundation Shade Finder Solutions into Its Online Shopping Experience*. https://www.perfectcorp.com/business/successstory/Wardah-virtual-try-on-

success-story

data.goodstats.id. (n.d.). *10 Brand Kosmetik Terlaris di Asia Tenggara, Ada 2 dari Indonesia!* 2025. https://data.goodstats.id/statistic/10-brand-kosmetik-terlaris-di-asia-tenggara-ada-2-dari-indonesia-Uj8t6

Dreamlab.id. (2025). *State of Beauty 2025: Tren Kecantikan, Pertumbuhan Industri Kosmetik & Perubahan Pasar*. https://dreamlab.id/state-of-beauty-2025-tren-kecantikan-pertumbuhan-industri-kosmetik-perubahan-pasar/

Gaudich. (2024). *The Impact of Augmented Reality in Cosmetic Brands: The influence of Virtual Try-on tools on the decision-making process of Portuguese women*. *4*(02), 7823–7830.

Ghozali, & Latan. (2020). *Partial least squares: Konsep, metode dan aplikasi menggunakan program SmartPLS 3.0*.

Goodstats.id. (2023). *Sensus BPS: Saat Ini Indonesia Didominasi Oleh Gen Z*. https://data.goodstats.id/statistic/sensus-bps-saat-ini-indonesia-didominasi-oleh-gen-z-n9kqv

Goodstats.id. (2024). *Brand Kecantikan Lokal Geser Dominasi Brand Global pada 2024*. https://goodstats.id/article/brand-perawatan-kecantikan-lokal-menggeser-dominasi-brand-global-pada-2024-gQLD2

Google, Temasek, & B. & C. (2023). *GMV dan pendapatan terus tumbuh di tengah inflasi dan persaingan*. https://economysea.withgoogle.com//intl/id_id/home/

Hair, J. ., R.E, A., B.J, B., & W.C, B. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)*.

Hun, K. B., Aminah, F., Putri, E., & Dhae, Y. R. (2023). *Kajian Hubungan Antara Kualitas Pelayanan E-Commerce, Kepuasan Pelanggan, dan Keputusan Pembelian*. *3*, 3832–3841.

Index, T. B. (2025). *Top Brand Index*. https://www.topbrand-award.com/top-brand-index/

Katadata.co.id. (2024). *Barang-barang yang Paling Banyak Dibeli Online Gen Z dan Milenial Indonesia*. https://databoks.katadata.co.id/produk-konsumen/statistik/7c140bfc1fc464f/barang-barang-yang-paling-banyak-dibeli-online-gen-z-dan-milenial-indonesia

Ken Research, 2023. (2023). *Persaingan kosmetik*. Prospek Pasar Kosmetik Indonesia Hingga 2030. https://www.kenresearch.com/industry-reports/indonesia-cosmetics-market

Kompas, L. (2023). *Kualitas Barang Pengaruhi Anxiety Masyarakat dalam Bertransaksi secara Digital, Ini Solusinya Artikel ini telah tayang di Kompas.com dengan judul "Kualitas Barang Pengaruhi Anxiety Masyarakat dalam Bertransaksi secara Digital, Ini Solusinya", Klik untuk b*. https://money.kompas.com/read/2023/04/14/181500426/kualitas-barang-pengaruhi-anxiety-masyarakat-dalam-bertransaksi-secara-digital

Lutfi Nur Rizki, & Bowo Santoso. (2023). Pengaruh Kepuasan Transaksi Online Shopping dan Kepercayaan Pelanggan terhadap Proses Pengambilan Keputusan Pelanggan

menggunakan E-Commerce. *Jurnal Ilmiah Dan Karya Mahasiswa*, *1*(4), 143–152. https://doi.org/10.54066/jikma.v1i4.484

Markethac. (2025). *Maybelline Dominasi Lip Product*. https://markethac.id/report-news/news/maybelline-dominasi-lip-product-tapi-market-share-kalah-dari-brand-lokal

Micheletto, V., Accardi, S., Fici, A., Piccoli, F., Rossi, C., Bilucaglia, M., Russo, V., & Zito, M. (2025). Enjoy it! Cosmetic try-on apps and augmented reality, the impact of enjoyment, informativeness and ease of use. *Frontiers in Virtual Reality*, *6*. https://doi.org/10.3389/frvir.2025.1515937

Michella, D., & Meilani, Y. F. C. P. (2023). Pengaruh High Performance Work Practice (Hpwp) Terhadap Job Satisfaction Di Rs Xyz Magelang. *Ilmiah Manajemen Bisnis Dan Inovasi*, *10*(1), 635–643.

Mudjiyanto, B., Kusuma, P., & Ilmu Komunikasi, P. (2025). Fenomena Gaya Hidup Gen Z Indonesia (Antara Tren Perilaku Impulsive dan Rekognisi Positive Emotion). *Jurnal Sosial Dan Humaniora*, *2*(3), 73–89. https://doi.org/10.62017/arima

Portal Infomasi Indonesia. (2023). *Pasar Kosmetik Indonesia Melesat 48 Persen, Peluang IKM Berinovasi*. https://indonesia.go.id/kategori/editorial/8516/pasar-kosmetik-indonesia-melesat-48-persen-peluang-ikm-berinovasi?lang=1

Statistik, B. P. (2024). *Statistik Daerah Kota Makassar 2024*. *10*, *2024*.

Sunarya, S. &. (2024). *Analisis Kepuasan Konsumen Memediasi Pengalaman Belanja Online Dalam Membentuk Loyalitas Pelanggan (Survei E-Commerce Bukalapak)*. *10*(6), 1112–1116.

Wirvani, N., Ariyanti, M., & Indonesia, U. T. (2024). *The Effect of E-Service Quality on Repurchase Intention of KAI Access Users with Customer Satisfaction as an Intervening Variable*. *03*(05), 1026–1036.