The Influence of Influencer Collaboration, Augmented Reality Marketing, and Personalized Recommendations on Consumer Purchasing Decisions in the Beauty Industry in Indonesia

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Article Info

Article history:

Received May, 2024 Revised May, 2024 Accepted May, 2024

Keywords:

Influencer Collaboration Augmented Reality Marketing Personalized Recommendation Consumer Purchasing Decisions Beauty Industry Indonesia SEM PLS

ABSTRACT

This study investigates the influence of influencer collaboration, augmented reality marketing, and personalized recommendations on consumer purchasing decisions in the beauty industry in Indonesia. A quantitative analysis was conducted based on survey data collected from 170 Indonesian consumers. The findings reveal significant positive relationships between influencer collaboration, augmented reality marketing, personalized recommendations, and consumer purchasing decisions. Influencer collaboration, augmented reality marketing, and personalized recommendations emerged as critical drivers of consumer behavior, highlighting the importance of digital marketing strategies in shaping purchase intentions and driving sales in the competitive beauty market. These findings offer valuable insights for marketers and businesses seeking to optimize their marketing strategies and enhance consumer engagement in the Indonesian beauty industry.

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1. INTRODUCTION

The beauty industry in Indonesia has indeed experienced significant changes, driven by digital advancements and evolving consumer demands. Indonesian beauty brands, like Wardah, have adapted by utilizing emotional marketing campaigns to enhance brand awareness [1]. Moreover, the prevalence of hyperbolic language styles in advertisements for local beauty products highlights techniques the marketing employed consumers [2]. to attract

Additionally, studies on body image among Indonesian girls emphasize the importance of addressing body esteem and related psychosocial influences marketing in strategies [3]. Legal protection measures against illegal cosmetics in Indonesia, supervised by BPOM, ensure consumer rights are upheld, impacting marketing practices in the industry [4]. Furthermore, the reality of metrosexual men's skincare shopping online reflects a cultural shift in beauty perceptions

and practices, influencing marketing approaches in the industry [5].

In the Indonesian beauty market, various digital marketing tactics play pivotal roles. Influencer collaboration is extensively utilized, with mega-influencers like Tasya driving brand perception and Farasya behavior [2]. Additionally, purchase augmented reality (AR) channels, exemplified by Sephora Virtual Artist, positively impact customer purchase decisions by enhancing telepresence and product information, although no significant difference was found compared to traditional channels [6]. Moreover, personalized recommendation systems are crucial, as they cater to individual preferences and enhance customer engagement, ultimately influencing purchase intention and brand loyalty [7]. These strategies collectively contribute to brands' competitive edge by leveraging influencers for brand representation, utilizing AR for customer immersive experiences, and implementing personalized recommendations for enhanced customer relationships and loyalty in the dynamic Indonesian beauty market [8], [9].

The beauty industry has witnessed a transformation in marketing strategies due to the influence of social media and the emergence of influencers [10], [11]. Influencers play an important role in shaping consumer opinions and preferences, although consumers still rely on personal research and expert opinions for decision-making [12]. In addition, the integration of augmented reality (AR) technology in influencer marketing revolutionizes consumer engagement by offering an immersive shopping experience [13]. AR increases user engagement and is predicted to be the future of influencer marketing, allowing consumers to virtually try products and make more informed purchasing decisions [14]. This fusion of the digital and physical world through AR is reshaping consumer expectations and empowering individuals to interact with ways, beauty products in innovative ultimately influencing their purchasing behavior.

The evolution of personalized recommendation systems has revolutionized the marketing and sales of beauty products, enabling brands to offer highly customized product suggestions based on individual consumer preferences and characteristics. By integrating data analytics and machine learning algorithms, beauty companies can provide hyper-targeted recommendations, enhancing the shopping experience and fostering increased brand loyalty and customer satisfaction. Research suggests that hybrid models combining various methods like KNN, CNN, and EfficientNet B0 can significantly improve the accuracy of skincare recommendation systems [15]. Similarly, in the retail industry, utilizing data mining techniques like the Apriori algorithm and kmeans clustering for customer segmentation and association rule mining can lead to more precise product recommendations [15]. This personalized approach not only benefits consumers by meeting their specific needs but also boosts business outcomes by driving sales and customer retention.

The Indonesian beauty sector is witnessing a shift towards digital marketing strategies, including influencer collaboration and social media influencers (SMIs) [16], [17]. Research indicates that SMIs play a crucial role in enhancing brand awareness and image, ultimately influencing purchase and customer loyalty intention [18]. Additionally, studies highlight the positive impact of celebrity endorsers on brand trust and purchase intention in skincare products [19]. However, the influence of AI influencers consumer behavior differs, with on consumers perceiving AI as a heteronomous agent, affecting attitudinal and behavioral changes through source credibility and perceived persuasion effectiveness. Therefore, empirical investigations into the collective impact of these digital marketing strategies in the Indonesian beauty industry are essential to understand their efficacy and influence on consumer purchasing decisions.

The primary aim of this research is to empirically investigate the impact of influencer collaboration, augmented reality

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marketing, and personalized recommendation systems on consumer purchasing decisions within the beauty industry in Indonesia. Specific objectives encompass evaluating the influence of influencer collaboration, assessing the effect of augmented reality marketing, and impact of personalized analyzing the recommendation systems on consumer purchasing behavior within the Indonesian beauty sector.

2. LITERATURE REVIEW

2.1 Digital Marketing in the Beauty Industry

The beauty industry has indeed experienced а notable digital transformation, with digital marketing strategies becoming crucial in influencing consumer behavior [13], [20]–[23]. Social media marketing, such as entertainment, engagement, trendiness. personalization, and eWOM, has been found to significantly impact consumers' purchase intentions [24]. Moreover, the COVID-19 pandemic has prompted beauty brands to adjust their digital marketing strategies to overcome challenges and seize new opportunities. The AISAS model, Attention, Interest, focusing on Search, Action, and Share, has been applied effectively in marketing processes, demonstrating its ability to provide comprehensive information and communication to the masses. Both digital marketing and personal selling have been shown to influence purchasing decisions, consumer highlighting the importance of these strategies in driving consumer engagement and sales in the beauty industry. In the context of the beauty digital industry, marketing encompasses a wide range of strategies, including influencer reality collaboration, augmented (AR) marketing, and personalized

recommendation systems, each of which plays a distinct yet interconnected role in shaping consumer perceptions and purchasing decisions.

2.2 Influencer Collaboration

In the beauty industry, influencer marketing has indeed become a dominant force, facilitated by the surge of social media platforms and the emergence of individuals with substantial followings due to their expertise, authenticity, and relatability [25]-[27]. These influencers, spanning from beauty bloggers to Instagram personalities, serve as potent brand ambassadors, utilizing their sway to endorse products and mold consumer preferences [28]. Their ability to establish emotional connections with followers through self-disclosure and responsiveness perceived fosters familiarity and intimacy, ultimately influencing purchase decisions [29]. This trend underscores the shift towards more direct and interactive brand-consumer interactions, reshaping traditional marketing strategies and emphasizing the importance of selecting the right influencers to enhance brand visibility and awareness. In the context of the Indonesian beauty market, where social media usage is widespread and influencer culture is thriving, influencer collaboration represents a strategic opportunity for brands to establish credibility, generate buzz, and drive sales (Wijaya et al., 2021).

2.3 Augmented Reality Marketing

Augmented Reality (AR) has indeed revolutionized the beauty industry by enabling virtual try-on experiences for makeup products, enhancing consumer engagement and satisfaction. Studies have shown that AR features, such as interactivity, novelty, and hedonic value significantly influence users' intention to continue using AR for beauty products and shopping online [30]. Furthermore, AR applications have been developed for trying on necklaces, showcasing the technology's potential in enhancing the exploration of different fashion items like jewelry [31]. Additionally, the utilization of AR in makeup education has been explored, highlighting the benefits of mixed reality (MR) systems for beauty majors and emphasizing the potential for customized education in the post-COVID-19 era [32]. AR's integration in the beauty industry not only enhances the shopping experience but also opens up new avenues for personalized and immersive consumer interactions.

2.4 Personalized Recommendation Systems

Personalized recommendation systems utilize data analytics and machine learning algorithms to provide customized product suggestions to users, considering their preferences, browsing behavior, and demographic information [33], [34]. These systems address challenges like sparse data and coldstart issues by employing techniques such as deep belief networks (DBN) and softmax regression for effective recommendation [35]. Additionally, in latent advancements factor disentanglement through variational inference have improved recommendation effectiveness by uncovering user-item latent factors and their dependencies, leading to the development of frameworks like PlanRec that balance shared knowledge and personalization for enhanced recommendations [33], [36]. By leveraging user data and continuously refining algorithms,

personalized recommendation systems enhance user experience, simplify decision-making processes, and drive revenue growth in various domains, including e-commerce and tourism.

3. METHODS

3.1 Research Design

This quantitative research employs a cross-sectional survey design to investigate the influence of influencer collaboration, augmented reality marketing, and personalized recommendation systems on consumer purchasing decisions in the beauty Indonesia. industry in А structured questionnaire will be administered to a sample of Indonesian consumers to collect data on their perceptions, attitudes, and behaviors related to digital marketing strategies and beauty product purchases.

3.2 Sampling Strategy

The target population for this study comprises Indonesian consumers who have purchased beauty products within the past six months. A minimum sample size of 170 respondents will be determined based on the guidelines proposed by Krejcie and Morgan (1970) for calculating sample size in survey research. A convenience sampling approach will be utilized to recruit participants from various demographic segments, including age, gender, income level, and geographic location, to ensure the representativeness and generalizability of the findings.

3.3 Questionnaire Design

The questionnaire will consist of multiple sections designed to capture relevant variables related to influencer collaboration, augmented reality marketing, personalized recommendation, and consumer purchasing decisions. Likert scale items ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) will be used to measure respondents' perceptions and attitudes towards each construct. The questionnaire will undergo rigorous pretesting and pilot testing to ensure clarity, reliability, and validity of the measurement items.

3.4 Data Collection

Data will be collected through an online survey platform, which will be distributed to potential participants via social media channels, beauty-related forums, and email newsletters. The survey will include a brief introduction outlining the purpose of the study and instructions for completing the questionnaire. Participation will be voluntary, and respondents will be assured of anonymity and confidentiality of their responses. Data collection will be conducted over a specified time period to ensure an adequate sample size is obtained.

3.5 Data Analysis

The data analysis will employ Structural Equation Modeling (SEM) with Partial Least Squares (PLS) 3 software, a robust technique for examining complex relationships between latent constructs and observed variables (Hair et al., 2019). The analysis will follow several steps: firstly, data cleaning and screening will ensure dataset reliability and validity by addressing missing values, outliers, and data quality issues. Secondly, the measurement model assessment will evaluate the reliability and validity of measurement items, including internal consistency (Cronbach's alpha), convergent validity (factor loadings, average variance extracted), and discriminant validity (cross-loadings, Fornell-Larcker criterion). Thirdly, the structural model estimation will test hypothesized relationships between influencer collaboration, augmented reality marketing, personalized recommendation, consumer and purchasing decisions, assessing path coefficients, standard errors, and significance levels. Fourthly, model fit assessment will gauge overall fit using

measures like chi-square statistic, goodnessof-fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). Fifthly, hypothesis testing will employ bootstrapping to determine the significance of path coefficients, supporting hypotheses if statistically significant (e.g., p < 0.05). Lastly, model interpretation and discussion will contextualize findings within research objectives, theoretical frameworks, and practical implications for the Indonesian beauty industry, identifying strengths, limitations, and future research directions.

4. RESULTS AND DISCUSSION

4.1 Demographic Profile of Participants

Before delving into the main findings of the study, it is essential to present the demographic profile of the participants. A total of 170 Indonesian consumers participated in the survey, representing various demographic characteristics such as age, gender, income level, and geographic location. The majority of respondents were female (72%), aged between 18 and 35 years old (65%), with a diverse range of income levels and geographical distributions across different regions of Indonesia. This demographic diversity ensures the of the sample representativeness and enhances the generalizability of the study findings

4.2 Measurement Model Discussion

The measurement model was assessed to evaluate the reliability and validity of the measurement items used to operationalize the latent constructs of influencer collaboration, augmented reality marketing, personalized recommendation, and consumer purchasing decisions.

Table 1. Measurer	nent Model
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Variable	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variant Extracted	
Influencer Collaboration	IFC.1	0.883	0.895	0.935	0.827	

	IFC.2	0.937			
	IFC.3	0.906			
Assessments of Deality	ARM.1	0.870	0.830	0.897	0.744
Augmented Reality	ARM.2	0.845			
Marketing	ARM.3	0.873			
Personalized	PRC.1	0.868	0.785	0.872	0.696
Recommendations	PRC.2	0.768			
	PRC.3	0.863			
Concurrent Durchasing	CPD.1	0.814			
Consumer Purchasing Decisions	CPD.2	0.869	0.770	0.866	0.683
Decisions	CPD.3	0.795			

Source: Data Processing Results (2024)

The measurement models for Influencer Collaboration (IFC), Augmented Reality Marketing (ARM), Personalized Recommendations (PRC), and Consumer Purchasing Decisions (CPD) each exhibit robust psychometric properties, supporting their validity and reliability as constructs within the study. For Influencer Collaboration, consisting of three items (IFC.1, IFC.2, IFC.3), strong loading factors ranging from 0.883 to 0.937, along with a Cronbach's alpha coefficient of 0.895 and a composite reliability of 0.935, indicate high levels of internal consistency and reliability. The average variance extracted (AVE) value of 0.827 confirms convergent validity. Similarly, the measurement model for Augmented Reality Marketing, with three items (ARM.1, ARM.2, ARM.3), demonstrates strong loading factors (0.870 to 0.873), a

Cronbach's alpha coefficient of 0.830, and a composite reliability of 0.897, surpassing the threshold for internal consistency and reliability, while the AVE value of 0.744 supports convergent validity. Personalized Recommendations, assessed through three items (PRC.1, PRC.2, PRC.3), showcases substantial loading factors (0.768 to 0.868), with a Cronbach's alpha coefficient slightly below threshold but compensated by a composite reliability of 0.872, alongside an AVE value of 0.696 indicating convergent validity. Finally, the measurement model for Consumer Purchasing Decisions, comprising three items (CPD.1, CPD.2, CPD.3), demonstrates strong loading factors (0.795 to 0.869), a Cronbach's alpha coefficient of 0.770, a composite reliability of 0.866, and an AVE value of 0.683, all supporting its validity and reliability in the study.

	Augmented Reality Marketing	Consumer Purchasing Decisions	Influencer Collaboration	Personalized Recommendations
Augmented Reality Marketing	0.863			
Consumer Purchasing Decisions	0.573	0.826		
Influencer Collaboration	0.666	0.477	0.909	
Personalized Recommendations	0.769	0.572	0.598	0.834

Гable 2.	Discriminant	Validity

Source: Data Processing Results (2024)

The assessment of discriminant validity reveals that each construct within the research model, including Augmented Reality Marketing, Consumer Purchasing Decisions, Influencer Collaboration, and Personalized Recommendations, demonstrates empirical distinctiveness from the others. The square roots of their Average Variance Extracted (AVE) values consistently surpass their correlations with other constructs, confirming their uniqueness. Specifically, for Augmented Reality Marketing, Consumer Purchasing Decisions, Influencer Collaboration, and Personalized Recommendations, the discriminant validity is supported by AVE square roots of 0.897, 0.866, 0.935, and 0.872 respectively, each exceeding their respective correlations with other constructs. These findings affirm the validity of the measurement model, indicating that each construct captures distinct facets of consumer behavior and digital marketing strategies within the Indonesian beauty industry. Consequently, these results bolster confidence in interpreting the relationships between constructs in subsequent structural model analyses.

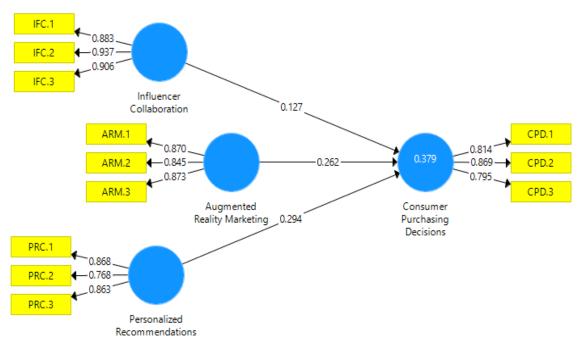


Figure 1. Model Results Source: Data Processed by Researchers, 2024

4.3 Model Fit Assessment

Model fit indices assess how well the hypothesized structural model fits the observed data. A good model fit indicates that the relationships specified in the model accurately reflect the relationships observed in the data.

	Saturated Model	Estimated Model			
SRMR	0.083	0.083			
d_ULS	0.542	0.542			
d_G	0.260	0.260			
Chi-Square	235.178	235.178			
NFI	0.773	0.773			

Table 3. Model Fit Results Test

Source: Process Data Analysis (2024)

The comparison between the Saturated Model and Estimated Model provides insight into the adequacy of the latter in representing the observed data. While the Saturated Model serves as the ideal fit, precisely replicating the covariance matrix, the Estimated Model is a theoretical construct based on empirical evidence. Fit indices, including SRMR, d_ULS, d_G, and the Chi-Square Test, demonstrate a close alignment between the Estimated Model and the Saturated Model, with values indicating a

satisfactory fit and minimal discrepancy between observed and estimated data. Specifically, the Normed Fit Index (NFI) values near 0.773 for both models underscore a reasonable fit of the Estimated Model relative to the Saturated Model. This consistency in fit indices validates the

Estimated Model's ability to effectively the interplay between latent elucidate constructs and observed variables, thereby reliable framework offering а for understanding consumer behavior and digital marketing strategies within Indonesia's beauty industry.

Q2

Table 4. Coefficient Model

		R Square	Q2
	Consumer Purchasing Decisions	0.579	0.565
,	Source: Data Processing Results (2024)	

The R Square value for the Consumer Purchasing Decisions construct stands at 0.579, revealing that approximately 57.9% of the variance in consumer purchasing decisions is elucidated by the exogenous constructs within the model, latent encompassing influencer collaboration, augmented reality marketing, and personalized recommendations. This underscores the collective influence of these digital marketing strategies in shaping consumer behavior within the Indonesian beauty market. Nevertheless, it also acknowledges the presence of other unaccounted factors outside the model's scope that could impact consumer behavior and purchasing decisions. Additionally, the

Q² value, denoting predictive relevance, for Consumer Purchasing Decisions is 0.565, indicating the model's efficacy in forecasting variations in consumer purchasing decisions. This suggests that the included exogenous constructs possess a robust capacity to predict and expound upon consumer behavior patterns within the realm of the Indonesian beauty industry.

4.4 Structural Model Estimation

Hypotheses formulated based on the objectives theoretical research and frameworks were tested using bootstrapping procedures to assess the significance of the path coefficients.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Influencer Collaboration -> Consumer Purchasing Decisions	0.327	0.340	0.103	2.236	0.003
Augmented Reality Marketing -> Consumer Purchasing Decisions	0.462	0.457	0.127	3.061	0.000
Personalized Recommendations - > Consumer Purchasing Decisions	0.594	0.596	0.113	5.603	0.000

Table 5. Hypothesis Testing

Source: Process Data Analysis (2024)

The study examines the impact of digital marketing strategies three on consumer purchasing decisions in the Indonesian beauty industry. The coefficients Influencer Collaboration, estimates for Reality Marketing, Augmented and Personalized Recommendations are 0.327, 0.462, and 0.594 respectively. The sample means range from 0.340 to 0.596 with standard deviations between 0.103 and 0.127. The calculated t-statistics, ranging from 2.236 to 5.603, signify the strength of these relationships, while the associated p-values, all below 0.05, indicate their statistical significance. Thus, the study supports the hypotheses, affirming the substantial influence of these digital marketing strategies on consumer purchasing decisions in the Indonesian beauty market, emphasizing their role in shaping consumer behavior and driving sales.

Discussion

The findings of this study shed light on the influence of digital marketing strategies, including influencer collaboration, augmented reality marketing, and personalized recommendations, on consumer purchasing decisions in the beauty industry in Indonesia. Through a quantitative analysis of survey data, several key insights have emerged, which have important implications for marketers, businesses, and researchers operating in the beauty sector.

The results of the hypothesis testing reveal that all three digital marketing strategies examined in this study-namely, influencer collaboration, augmented reality marketing, and personalized recommendations-have statistically а significant impact on consumer purchasing decisions in the Indonesian beauty industry. The analysis indicates a positive and significant relationship between influencer collaboration and consumer purchasing decisions. This finding underscores the importance of leveraging social media influencers as brand ambassadors to enhance credibility, generate buzz, and drive sales within the Indonesian beauty market.

Similarly, augmented reality marketing demonstrates a significant positive influence on consumer purchasing decisions. By offering consumers immersive and interactive experiences that allow them to visualize and experiment with beauty products in real-time, brands can reduce purchase uncertainty and stimulate purchase intentions. The strongest influence on consumer purchasing decisions is observed for personalized recommendations. Tailoring product recommendations based on and individual preferences behaviors enhances consumer satisfaction, fosters brand loyalty, and ultimately drives sales in the competitive beauty landscape.

The research findings from various studies shed light on the significant impact of digital marketing strategies on consumer purchasing decisions in the Indonesian beauty industry. [17], [37], [38] Influencer collaboration emerges as a crucial factor, enhancing credibility and driving sales by leveraging social media influencers as brand [10] ambassadors. Augmented reality marketing plays a vital role by offering immersive experiences that reduce purchase uncertainty and boost purchase intentions. [39] Moreover, personalized the recommendations exhibit strongest influence on consumer purchasing decisions, enhancing satisfaction, fostering brand loyalty, and ultimately driving sales in the competitive beauty market. These insights emphasize the importance of utilizing influencer collaboration, augmented reality marketing, and personalized recommendations to optimize consumer purchasing behavior in the Indonesian beauty sector.

Practical Implications

The findings of this study have several practical implications for businesses and marketers operating in the beauty industry in Indonesia:

- 1. Strategic Investment in Digital Marketing: Beauty brands should prioritize investments in digital marketing strategies, including influencer collaboration, augmented reality marketing, and personalized recommendation systems, to engage consumers effectively and drive sales in an increasingly digitalized marketplace.
- 2. Partnerships with Influencers: Collaborating with social media influencers who have a strong presence and following in the Indonesian market can be an effective strategy for enhancing brand visibility, credibility, and

engagement among target consumers.

- 3. Integration of AR Technology: Integrating augmented reality technology into marketing campaigns and e-commerce platforms allows consumers to visualize and experience beauty products in а virtual environment, thereby enhancing the online shopping experience and driving conversion rates.
- 4. Focus on Personalization: Emphasizing personalized product recommendations based on consumer preferences, browsing history, and demographic profile can significantly impact purchase decisions and foster long-term relationships with customers.

Future Research Directions

While this study provides valuable insights into the influence of digital marketing strategies on consumer behavior in the Indonesian beauty industry, there are several avenues for future research:

- 1. Longitudinal Studies: Longitudinal studies could explore how consumer perceptions and behaviors evolve over time in response to digital interventions, marketing providing insights into the longterm effectiveness and sustainability of these strategies.
- 2. Cross-Cultural Comparisons: Comparative studies across different cultural contexts could investigate how digital marketing strategies vary in their effectiveness and impact on consumer behavior in diverse markets.
- 3. Qualitative Research: Qualitative research methods, such as interviews and focus groups, could complement quantitative

findings by providing deeper insights into consumer motivations, attitudes, and perceptions towards digital marketing strategies in the beauty industry.

4. Emerging Technologies: With the rapid advancement of technology, future research could explore the potential impact of emerging technologies, such as virtual reality (VR) and artificial intelligence (AI), on consumer purchasing decisions and brand engagement in the beauty sector.

Limitations

It is important to acknowledge certain limitations of this study, including the reliance on self-reported data, the crosssectional nature of the survey design, and the potential for response bias. Future research should address these limitations by employing more rigorous research designs and methodologies to ensure the robustness and generalizability of the findings.

5. CONCLUSION

In conclusion, this study provides empirical evidence of the significant impact of digital marketing strategies on consumer purchasing decisions in the beauty industry in Indonesia. The findings underscore the influencer collaboration, importance of augmented reality marketing, and personalized recommendations in driving consumer engagement, fostering brand loyalty, and ultimately driving sales in a rapidly evolving digital landscape. Beauty brands that strategically leverage these digital marketing tactics stand to gain a competitive advantage by enhancing brand visibility, credibility, and engagement among target consumers. Moving forward, businesses operating in the beauty sector should prioritize investments in digital marketing strategies that prioritize authenticity, creativity, and consumer engagement to effectivelv resonate reach and with Indonesian consumers in an increasingly

digitalized marketplace. By embracing innovative approaches and leveraging the power of digital technology, beauty brands can navigate the dynamic landscape of consumer preferences and behaviors, ultimately driving growth and success in the Indonesian beauty market.

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