CONSUMER PERCEPTIONS OF AI-DRIVEN PERSONALISED RECOMMENDATIONS FOR COSMETIC PRODUCTS

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ABSTRACT

With the rapid technological advances in the beauty industry, the interaction between consumers and cosmetic brands are increasingly shaped by AI-enabled tools. Personalized recommendations have emerged as powerful digital interfaces that are redefining how consumers explore, evaluate, and select cosmetic products. As brands intensify their use of AI to enhance engagement and deliver individualized experiences, the need to understand consumer perception toward these technologies has become increasingly critical. This study is focused on examining, how consumers respond to AI-driven personalization offered by cosmetic brands. The paper identifies the key perceptual factors that influence consumer's to rely on these AI-enabled tools during their product decision-making process. The literature suggest that AI-enabled personalized recommendations feature exert a positive influence on consumers' perceptions of cosmetic products. The study conceptually synthesizes that consumers increasingly view this technology as a valuable aid in enhancing product evaluation and purchase experience. The outcomes of this research offer important implications for cosmetic brands and technology developers aiming to design more intuitive, trustworthy, and user-centred AI tools for cosmetic products.

Keywords: *Artificial Intelligence, Personalized Recommendation, Consumer Perception, Cosmetic Products*

INTRODUCTION

The Indian cosmetics market has long been significant, experiencing dramatic expansion driven by rising disposable incomes and evolving consumer lifestyles. Valued at approximately USD 14.6–17.27 billion in 2024, it is projected to reach USD 24.3–29.23 billion by 2032–2033, reflecting CAGRs of 5.9–8.28% amid urbanization and e-commerce growth. (IMARC Group, 2024). The expansion is driven by increased use of e-commerce platforms and also contributed by rising urbanization (Lee, 2024). The beauty and personal care industry is experiencing a transformative change with the emergence of new technologies such as artificial intelligence (AI), that enable users to explore, assess and make purchases on cosmetic products differently than they have before. Some of the key technological changes are AI enabled tools that can be found at all levels of an online retailer or app and also throughout a brands ecosystem. The tools mentioned above including but not limited to AI enabled product recommendations, virtual try-on for products, chatbots, and AI enabled skin analysis are increasing the ease of use, the accuracy, and user experience in the overall online cosmetic shopping experience (Grewal et al., 2021; Aggarwal, 2024). Additionally, younger consumers that are highly responsive to digital technology and able to navigate online shopping experiences are being increasingly impacted by AI driven retail environments. Such personalization enables consumers to feel less overwhelmed by choice, perceive greater relevance, and experience increased satisfaction when making choices regarding cosmetic products. Although AI is rapidly becoming more integrated into beauty retail, there is still very little published research focused on consumers' perceptions and reactions to the AI technologies that are being used to support their shopping experiences on-line, especially in relation to online cosmetic shopping. Although the number of studies looking at the adoption of AI in general across various industries is relatively small, it is even smaller in terms of studies focusing on AI based technologies in the cosmetic industry.

Applications of emerging AI technology, including autonomous AI agents, AR shopping interfaces, and computer vision systems are changing the way companies compete by creating stronger connections with customers and creating a new paradigm for the interaction between digital brands and customers (Gokhale et al., 2025).

LITERATURE REVIEW

Artificial Intelligence in Marketing

Ther marketing ecosystems are improved and reshaped by Artificial intelligence by improving targeting accuracy, decision-making efficiency, and digital consumer–firm interactions. AI-driven digital environments also stimulate new behavioral patterns among consumers. Dwivedi et al. (2020) demonstrate that immersive and personalized AI environments significantly influence consumer decision-making and expectations.

Several studies emphasize AI's transformative potential in marketing operations. Haleem et al. (2022) argue that AI's ability to monitor and analyze purchasing patterns enables brands to deliver highly customized communication.

AI in Online Retail and Consumer Behaviour

Artificial Technologies have a major role in forming the online purchase behaviour of consumers through recommendation system, agents and advisor. Customer service benefits from "humanized" chatbots that balance efficiency with personalization, reducing response times while maintaining satisfaction, though trade-offs persist in robotics applications (Schanke et al., 2021; Tofangchi et al., 2021). Sivasankari et al. (2025) demonstrate that AI systems using collaborative filtering and machine learning provide highly relevant product suggestions. Emerging applications—including autonomous AI agents, AR-enabled shopping platforms, and computer-vision systems—further enrich consumer experiences and operational security (Gokhale et al., 2025).

AI in the Cosmetics and Beauty Sector

The cosmetics and beauty industry has been particularly influenced by this technological shift. Global and regional markets including India's rapidly growing cosmetics sector are witnessing significant adoption of AI-enabled tools designed to enhance online shopping experiences. AI influences how brands and products are perceived and can alter consumer valuation of offerings (Yuan et al., 2022; Adwan et al., 2022). Consumers today interact with cosmetic brands not only through product displays but through intelligent digital interfaces such as personalized product recommenders, AI-powered chatbots, and virtual try-on applications. (Huang & Rust, 2021). Hash et al., (2025) highlight AI's role in skin analysis, personalized skincare, and market expansion through data analytics, machine learning, and real-time skin analysis, highlighting on the fact the marketing is shifting towards a broader shift for customized solutions.

Virtual Try-On Technologies

The augmented reality is integrated into Virtual try on technology which enables digital intersections of AI by simulating users images for purchase of cosmetic products. Due to this feature the purchase intention intensifies as it reduces ambiguity and enhance the interactivity Virtual Try-On, which uses augmented reality (AR) and machine learning models, has grown in popularity in recent years, changing the way people shop for apparel and accessories. This new technology enables consumers to virtually try on numerous things without physically visiting a store, giving a simple and effective approach to make purchasing selections from the comfort of their own homes Akter, (2025). Research also highlights the role of virtual mirrors and on-demand beauty applications in improving customer service and decision quality (Javornik et al., 2022).

AI Chatbots in Cosmetic Retail

AI chatbots, enabled by natural language processing and machine learning, play a significant role in service, marketing, and communication contexts. Chakraborty et al. (2024) find that AI-enabled tools when chatbots are combined with recommendations, including augmented reality, positively influence adoption and purchase intentions. Study by Winarto (2024) state that application which are cosmetics-specific like Garnier Skin Coach AI reflect that interactive chatbots create hedonic value for Gen Z consumers, enhancing purchase confidence through personalized regimen suggestions. Sheehan et al. (2023) confirm social presence in beauty chatbots mediates the trust-purchase intention relationship, critical for experience goods like cosmetics.

Personalized Recommendation Systems

One of the latest technologies that are still transforming retail and the consumer experience is artificial intelligence (AI), specifically personalised recommendation systems that use machine learning algorithms to process user data and forecast their likes and dislikes (Necula & Păvăloaia, 2023). In the current study, AI-based product personalization refers to the use of artificial intelligence to tailor the composition, color, texture, packaging, and dermatological activity of cosmetic products to match specific needs and preferences of individual customers. This approach was embraced in the beauty industry by modifying the core offerings to match personal preferences and has been adopted by cosmetics corporations as a source of brand improvement (Checa et al., 2025). The current research assumes that AI-driven recommendations are further developed to create products that are tailored to meet individual needs.

Personalized recommendation systems utilize collaborative and content-based filtering techniques to process user data and deliver tailored product suggestions. Prior studies demonstrate that personalized recommendations enhance relevance, reduce cognitive load, and increase consumer receptiveness.

Personalization of AI in marketing practices can enhance customer interaction and expand business operations by addressing content to the consumer behavior and demographics. Babatunde et al., (2024). One to one product recommendations are positively correlated with the satisfaction of the users in an e-commerce set up. Gupta, R. (2025). AI-based technologies help make the online shopping experience more enjoyable and efficient by offering customers personalized suggestions, secure financial operations, and effective customer care, which makes it a better experience. Aggarwal et al., (2024). The personalized recommendation systems through AI can enhance the user experience and profitability of the business in several sectors, although it needs to handle the ethical concerns and data privacy matters. Jadiga, S. (2025).E-commerce AI-driven personalization contributes to customer engagement, satisfaction, and loyalty and influences the trends in the market and responds to ethical issues. Raji et al., (2024). Visual E-Commerce with

AI-based short-form videos and personalized products suggestions are more likely to promote user engagement and conversion rates in online shopping. Fale, P. (2025).As the sphere of personalization develops, in the beauty sector it is used not only to attain functional accuracy but also to strengthen emotional closeness, which is especially relevant to Generation Z consumers. The article by SobolievaH., & Ivanova, A. (2025) targets the use of artificial intelligence (AI) to support the process of personalization in a cosmetics market, The study concludes that AI-driven personalization has great possibilities to transform the cosmetics world and allow brands to meet the demands of specific consumers in an effective manner. Product recommendation system uses filtering based on content that provides customized recommendation which has a potential to transform experiences of consumer. Vinutha et al., (2024).

The aesthetic fit and sensory appeal are the most important factors in the cosmetic industry, however, tolerance to these systems among the consumers will not only be determined by the correctness of the recommendations, but also by the trust, privacy and perceived value (Siegel, 2019).

The use of AI personalization to affect consumer adoption and consumers shopping experience has been the focus of recent research, frequently citing other well-established models, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Combining TAM and UTAUT, Ahmed and Kumar (2023) understand AI personalization adoption by highlighting performance expectancy and effort expectancy as key factors in the consumer setting. The models are used to anticipate behavioral intentions based on such aspects as social influence and facilitating conditions that can be applied to retail AI tools. Hallur et al., (2021)

Sharma and Garg (2023) connected AI personalization to improved customer experience in the retailing process showing that the use of personalized services towards enhancing user engagements on the internet. Awad and Krishnan (2023) explore the issue of Trust and willingness which are moderated by privacy in AI Influence. It is demonstrated by Verma and Tiwari (2023) that AI personalization has an effect on online shopping through the mediator of trust, and transparency improves purchase intentions.

Consumer Perceptions of AI Technologies

Consumer perception encompasses cognitive, experiential, and emotional evaluations of technological features (Grewal et al., 2021). Past studies have linked perceptions of accuracy, informativeness, interactivity, convenience, and enjoyment to consumer acceptance of digital tools (Wang et al., 2020).

KEY CONSUMER PERCEPTION CONSTRUCTS

Perceived Ease of Use

Defined as the belief that using a system requires minimal effort (Davis, 1989). In the context of AI-enabled cosmetic tools, consumers judge how easily they can navigate, operate, and integrate these technologies into their shopping routines (Micheletto et al., 2025).

Perceived Usefulness

It refers to the belief that a system enhances task performance (Davis, 1989). Applied to cosmetic shopping, consumers find AI tools valuable when they improve product evaluation, reduce risk, and strengthen decision accuracy (Uzir et al., 2023).

Perceived Enjoyment

Captures the intrinsic pleasure derived from using a system, independent of task outcomes (Davis, 1992; Venkatesh, 2000).

Perceived Personalization

The extent to which a message or recommendation fits consumer preferences (Coong Li, 2016). In cosmetics, personalization involves tailoring suggestions to skin type, usage patterns, and individual beauty concerns (Kim & Lee, 2025).

Perceived Interactivity

Involves responsive and navigable digital interfaces (Wu, 1999). Interactive AI systems—such as virtual try-ons and responsive chatbots—create a sense of involvement that enhances consumers' online shopping flow (Bauer & Gürhan, 2024).

Attitude Toward AI

Refers to a consumer's overall positive or negative evaluation of using AI (Ajzen & Fishbein, 1980; Davis, 1986). Consumers' favourability toward AI influences their engagement, trust, and openness to AI-based product assistance (Chakraborty et al., 2024).

Purchase Intention

The willingness or plan to buy a product (Fishbein & Ajzen, 1975). Consumers who find AI systems useful, enjoyable, personalized, and trustworthy exhibit stronger intentions to purchase cosmetic products through AI-enabled platforms (Guerra-Tamez, 2024). In the cosmetics context, consumers' favourability toward AI strongly affects engagement, trust, and openness to AI-based product assistance (Chakraborty et al., 2024). Many consumers use AI cosmetic tools because they find them engaging and visually stimulating (Micheletto et al., 2025).

Thematic Review of the Previous research.

To synthesise existing research on the theme of personalised recommendation systems on a systematic and planned level in the context of artificial intelligence and the cosmetics and beauty industry, a thematic review of current and related articles was done. This review was aimed at determining the recurrent patterns, dominant constructs, and salient outcome variables that have been interrogated by previous literature. The thematic approach helps to have a systematic understanding of how consumers perceive and evaluate the use of the AI-powered

recommendation systems and respond to them, as they avoid introducing a disjointed listing of separate studies. The review identified a number of common themes which constantly appear throughout the literature as summarised in Table 1.

Table 1

Theme	Description	Key Constructs	Representative Studies
Perceived Personalization Quality	Functional and contextual relevance of AI recommendations to individual consumer preferences	Personalization, Customization, Accuracy	Abu-Shanab et al., 2023; Adawiyah et al., 2024; Beem, 2025; Reddy & Kamble, 2025; Sowmiya, 2025; Perumal et al., 2025
Perceived Enjoyment & Engagement	Hedonic and immersive experiences of interacting with AI tools	Enjoyment, Engagement, Immersion	Chakraborty et al., 2024; Micheletto et al., 2025; Yang & Lin, 2024; Voicu et al., 2023; Javornik et al., 2022
Perceived Usefulness / Efficiency	Functional benefits of AI tools for decision-making, convenience, and effectiveness	Perceived Usefulness, Ease of Use, Decision Support	Ahmed & Kumar, 2023; Sharma & Garg, 2023; Kumar et al., 2025; Bhatt, 2024; Zhang & Xiong, 2024
Trust in AI Algorithms	Confidence in AI recommendations and fairness of system	Trust, Algorithmic Reliability, Confidence	Ahn et al., 2022; O'Higgins & Fatorachian, 2025; Verma & Tiwari, 2023; Tofangchi et al., 2021; Schanke et al., 2021
Privacy & Data Security	Concerns regarding personal data collection and security during AI use	Privacy, Security, Risk	Awad & Krishnan, 2023; Dwivedi et al., 2021; Bhatt, 2024; Al-Okaily et al., 2021
Attitude Toward AI / Behavioral Intention	Consumers' psychological and behavioral responses toward AI recommendations	Attitude, Behavioral Intention, Purchase Intention	Sharma & Garg, 2023; Winarto, 2024; Seo & Kwon, 2025; Yoon & Lee, 2021

Customer Engagement & Purchase Response	Resulting actions, co-creation, and loyalty due to AI interaction	Engagement, Co-creation, Purchase Intention, Loyalty	Gao et al., 2023; Chakraborty et al., 2024; Reddy & Kamble, 2025; Sivasankari et al., 2025; Uzir et al., 2023
AI-Enabled Augmented Reality Experiences	AI combined with AR to enhance product exploration and try-on	Immersion, Enjoyment, Perceived Value	Adawiyah et al., 2024; Micheletto et al., 2025; Javornik et al., 2022; Whang et al., 2021; Yang & Lin, 2024; Haekyung Kim & Choo, 2021
Brand Evaluation & Marketing Effectiveness	AI's role in shaping brand perception and personalized marketing	Brand Perception, Marketing Effectiveness, Recommendation Quality	Yuan et al., 2022; Davenport et al., 2020; Libai et al., 2020; Zhang & Xiong, 2024; Parkkinen, 2024; Beem, 2025

The thematic synthesis highlights that the reaction of consumers to AI-based personalised recommendations depends on a combination of functional advantages, experiential value, personalisation perception, and factors related to trust, which in turn predetermine attitudes and behaviour intentions.

Research Gaps

Despite the growing body of literature about AI-driven personalised recommendations, it is clear that a number of research gaps can be identified based on the thematic review. To begin with, despite the fact that the past research has given significant focus to functional and hedonic issues like perceived usefulness, ease of use, and enjoyment, little effort has been channeled towards explaining the interaction of these factors in a single theoretical model with special reference to cosmetic and beauty products.

Another gap tends to focus on markets that are well-developed and generic e-commerce settings, thus limiting the external validity of the results to new markets and culturally diverse consumer groups. Being highly involved and personally relevant, the cosmetics industry is a rather unexploited category compared to other retail segments.

Further, as trust and privacy issues are often considered, their moderating or mediating effect on consumer attitudes and purchase intentions toward AI-driven recommendations has not adequately been discussed. The majority of studies

consider the issue of trust as a direct predictor and little is said about its conditional effects.
Lastly, a large part of the existing literature takes a more fragmented approach by examining single items, and there is little empirical combination of technological perceptions, affective reactions, and behavioural consequences.
This implies that there is an evident necessity to have an integrated model that consolidates the stimulus-organism-response dynamics that determine consumer reactions to AI-powered personalised recommendation systems.

THE KEY CONSTRUCTS.

AI-Related Perceptions

Past studies have shown that customers perceive AI-based recommendation systems in terms of the functional aspect (perceived usefulness and perceived ease of use), the experiential aspects (perceived enjoyment and interactivity).

Personalisation Quality

Personalisation quality is the degree to which AI-based recommendations are viewed as relevant, precise and fitting consumer-specific needs. Perceived personalisation is an important factor that affects consumers to evaluate AI-based recommendation systems in the cosmetics context, where the suitability of a product is a highly personal factor.

Belief in AI-Empowered Recommendations.

One of the key relational constructs in consumer relations with AI systems is trust. The ability of AI-driven recommendation assistants to be reliable, transparent, and handle data determines the degree at which consumers build trust in the system, leading to their readiness to trust the systems, especially when it comes to matters pertaining to personal information and those related to looks.

Attitude and behavioural response by consumers.

Consumer attitudes toward AI-driven recommendations affects behavioural results including purchase intention and consuming cosmetic brands.

Hypothesized Correlations between Constructs

AI Perceptions and Attitude of the consumer: The existing studies show that positive attitudes towards technology-enabled services are also influenced by positive attitudes towards AI systems, such as the perception of usefulness, ease of use, enjoyment, and interactivity. Once AI-powered recommendation systems are viewed as effective and entertaining, customers have a higher propensity to hold positive attitudes towards their application in the process of cosmetic products.

Proposition 1 (P1): The attitudes of the consumers towards AI-driven personalised recommendations in the cosmetics sector are positively correlated with positive AI-related perceptions (perceived usefulness, ease of use, enjoyment, and interactivity).

Impact of Quality of Personalisation: The quality of personalisation influences the perception of consumers in that AI recommendations are valuable and relevant, making them more willing to evaluate AI-based systems in general. In the cosmetics industry, personalisation works effectively to decrease the level of uncertainty in decisions, and enhance the perceived fit between the product and the personal needs.

Proposition 2 (P2): The perceived quality of personalisation has a positive impact on the attitude of consumers to AI-based personalised recommendations.

Trust, Consumer Evaluation: The trust is important in determining acceptance of AI-driven recommendations by consumers and this is especially the case when the recommendations are based on personal information. Higher trust reduces perceived risk and more willingness to use the recommendations of AI.

Proposition 3 (P3): The perception of AI-based recommendation systems positively affects the attitude and intention of consumers to AI-based personalised recommendations.

Attitude and Behavioural Outcomes: In line with other previous studies on consumer-behaviour, attitudes that are positive towards AI-based recommendations should lead to positive behavioural reactions, such as increased purchase intention and increased interest in cosmetic brands.

Proposition 4 (P4): The level of attitudes of consumers towards AI-based customised recommendations has a positive impact on their purchase intention and engagement behaviour.

DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH.

This conceptual paper, is based on a thematic synthesis of existing literature, outlines the combination of functional, experiential, personalisation-related, and trust-based forces to influence the consumer attitudes and behavioural intentions toward AI-based cosmetic recommendation services.

Theoretical Contributions

The study provides a number of theoretical contributions to the research. To begin with, it is a binding effort that incorporates various threads of artificial intelligence, personalisation, and consumer behaviour into an intellectual system that is unique to the cosmetics environment. Despite the previous studies that have targeted the perceived usefulness, enjoyment, trust, and personalisation scale, the current research conceptually combines the constructs to shed light on how consumers react to AI-based suggestions in a high-involvement and experience-based category of products. Second, the paper complements the technology-adoption theories, especially the Technology Acceptance Model (TAM) and the associated models of adoption, by placing the specified models into the framework of AI-based cosmetic retailing. The suggested framework highlights that consumer responses to AI in cosmetics are not only utilitarian, but they are also deeply rooted in hedonic,

emotional and appearance-centred factors, which have not been adequately represented in the wider retail AI literature. Third, the research narrows the scope of the issue of the influence of recommendation-specific aspects on AI attitudes and focuses on AI-based personalised recommendations and AI technologies, overall. This input is consistent with the accumulating literature that requires domain conceptualisations of AI in marketing. Lastly, as a conceptual input, the paper provides a theoretically based foundation on which future empirical research can be conducted by defining key constructs and suggesting logically derived correlations with one another. These hypotheses follow a systematic route of testing processes of consumer-AI interaction in the cosmetic and beauty market.

Managerial Implications

The practical implications of the study carried out hold theoretical implications in regard to cosmetic brands, digital marketers, and AI solution providers.

- The managers should understand that the effectiveness of the AI-based recommendation systems is not only based on the accuracy of the algorithm but also on convenience, entertainment, and interactivity. It is critical to develop user-friendly AI tools that appeal to consumers to develop positive attitudes and continued use.
- Companies should ensure that AI suggestions are valuable because it represents individual concerns. The personalization quality is of strategic importance if its is underpinned it can reduce the perceived value and trust of services which are AI enabled.
- The problems of trust and privacy play a central role in the appearance-focused product category. Managers are required to embrace open data and explain how consumer data are gathered, processed, and secured. The use of AI in a morally responsible manner and privacy can help build a consumer base and willingness to receive AI suggestions.
- The marketing communication plans must be determined to provide clear information to consumers regarding the benefits and drawbacks of AI recommendation tools. The resistance can be addressed by positioning AI as an assistant, not a replacement of human judgment, which will raise its acceptance, especially among those consumers who are reluctant to make decisions with the help of AI.

Future Research Directions

The connections outlined below should be empirically validated in subsequent research using rigorous quantitative and mixed-methods research designs on non homogenous groups of consumers. The longitudinal designs are particularly relevant in following the temporal changes in consumer trust, attitudes, and dependence on the AI-driven personalised recommendations in connection with the growing familiarity with AI technologies. Moreover, the role of the moderating

factors of demographic and psychographic factors, such as age, digital literacy, and privacy sensitivity, on consumer responsiveness to AI-powered cosmetic recommendations, should also be investigated. The experiential and appearance-focused nature of cosmetic consumption can be addressed by experimental studies that compare the different levels of personalization transparency, interactivity, and explainability because they can provide sensitive information on the best strategies to design AI. Moreover, the cross-cultural investigation across emerging and developed markets would enhance the application of the findings and enable a better understanding of customer-AI relationships in the international cosmetics and beauty industry.

CONCLUSION

The high pace of the artificial intelligence implementation into the cosmetics and beauty industry has essentially altered the nature of the consumer experience and evaluation of products to guide their decisions. Individualised suggestive systems that are based on artificial intelligence have become influential digital interfaces, thus informing consumer decision-making within a highly individualized and experience-based product category. The given conceptual paper attempts to address this gap by synthesising the existing body of knowledge and developing a unified framework that explains consumer responses to AI-based personalised recommendations in the cosmetics industry. Based on the previous results of marketing, retail, and technology-adoption studies, the study identifies the critical functions of functional perceptions, experiential value, the quality of personalisation, and trust considerations in consumer attitudes to AI-enabled recommendation systems, as well as in consumer behavioural intentions.

Practically, the study highlights the need to ensure that cosmetic brands and developers of technology design AI that is not only precise and efficient but also interesting, transparent, and consumer-focused. As a conceptual study, this paper does not empirically test any of the relationships, rather it provides a systematic basis of finding answers to this topic in the future. The research directions and the proposed framework can guide the scholars to validate the models, as well as expand the scope of research in different markets, consumer groups, and the use of technologies.

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