

Brand Personalization Strategies in the Digital Marketing Environment: A Case Study of L'Oréal

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Abstract. The diffusion of digital technologies has shifted brand marketing from mass communication toward individualized consumer dialogue, and personalization has become a central capability for competitive differentiation. This paper examines how global brands design and implement personalization strategies in digital marketing environments, using L'Oréal, the world's largest cosmetics group, as a case. Drawing on a qualitative, single-case design and secondary data, including corporate reports, press releases, and peer-reviewed research, the study analyzes L'Oréal's personalization initiatives across four dimensions: data infrastructure and artificial intelligence (AI)-based diagnostics, augmented reality (AR) virtual try-on services, omnichannel customer relationship management, and personalized content delivered through influencers and social platforms. The findings indicate that L'Oréal's approach rests on proprietary technology ownership, systematic integration of AI and AR into the consumer journey, and organizational structures that connect data science with brand management. The case also reveals tensions involving privacy, algorithmic bias, and digital exclusion that condition the effectiveness of personalization. The study contributes an integrated framework that links AI capabilities to personalization touchpoints and brand outcomes, and offers managerial guidance for consumer goods firms seeking to scale personalization without eroding consumer trust.

Keywords: personalization, digital marketing, artificial intelligence, brand strategy, L'Oréal

1. Introduction

The relationship between brands and consumers has been redrawn by digital technologies. Where firms once addressed anonymous mass audiences, they now operate inside dense networks of search engines, social platforms, mobile applications, and online stores, and each interaction within these networks leaves behavioural data that can be collected, analysed, and acted upon almost instantaneously [1]. This shift has made personalization one of the most consequential capabilities in contemporary marketing, because the same infrastructure that carries brand messages also records how individual consumers respond to them. Survey evidence suggests that 71% of consumers now expect personalized interactions, that 76% become frustrated when firms fail to deliver them, and that companies excelling at personalization generate 40% more revenue from these activities than average players [2]. At the same time, artificial intelligence (AI) has lowered the cost of tailoring

products, messages, and services to individuals, prompting predictions that both marketing strategies and customer behaviours will be restructured around machine intelligence [3].

Few industries illustrate this transformation as clearly as beauty and cosmetics, a category in which product fit is highly individual yet traditionally difficult to verify before purchase. L'Oréal, the world's largest beauty company, has positioned itself explicitly as a Beauty Tech enterprise that uses science and technology to craft beauty experiences with unprecedented levels of personalization [4]. In 2024, the group recorded sales of EUR 43.48 billion, of which 28.2% were generated through e-commerce channels, and reported more than 110 million uses of its Beauty Tech services [4]. These figures suggest that personalization at L'Oréal is not a peripheral experiment but a structural component of the business model, which makes the company an instructive setting for studying how personalization strategy is actually built.

The purpose of this paper is to examine how a global consumer brand operationalizes personalization in a digital marketing environment, and with what consequences. Three questions guide the analysis: first, through which digital touchpoints does L'Oréal implement personalization; second, which technological and organizational capabilities support these initiatives; and third, what tensions and risks accompany them. The study adopts a qualitative, single-case design based on secondary data. The remainder of the paper reviews the literature on personalization and AI in marketing, describes the methodology, presents the case background and the findings, and closes with a discussion of theoretical and managerial implications, limitations, and directions for future research.

2. Literature review

2.1. Personalization in digital marketing

Personalization lacks a single accepted definition. In an early conceptual analysis, Vesänen described it as the adaptation of the marketing mix to an individual customer based on information the firm holds about that customer, and organized the field around the execution of personalized marketing, the personalized marketing output, and the value created for both the customer and the marketer [5]. For customers, the expected benefits include a better preference match, improved service and communication, and the experience of being treated as an individual; the corresponding sacrifices involve privacy risk, spam exposure, invested time, and possible extra fees [5]. For the firm, personalization promises higher response rates, loyalty, satisfaction, and differentiation from competitors, offset by technology investments and the risk of irritating customers with poorly judged marketing output [5].

Digital environments have amplified both sides of this value equation. Digital marketing spans touchpoints across search, display, social, and mobile channels, and rests on data infrastructures that permit fine-grained targeting and near-real-time optimization [1]. Practitioner research indicates that the commercial stakes are material: faster-growing firms derive a considerably larger share of their revenue from personalization than slower-growing peers, and leading organizations treat personalization as an enterprise-wide capability supported by dedicated talent, agile operating models, and fit-for-purpose marketing technology, rather than as a narrow promotional tactic [2]. Personalization, in this reading, is simultaneously a consumer-facing experience and an organizational production system.

2.2. Artificial intelligence as an enabler of personalization

AI has moved personalization from rule-based targeting toward machine-driven customization. A strategic framework proposed by Huang and Rust distinguishes mechanical AI, which automates repetitive marketing functions; thinking AI, which processes data to arrive at decisions; and feeling AI, which analyses interactions and human emotions [6]. In their scheme, thinking AI carries the core burden of personalization at the marketing action stage, mechanical AI underpins standardization and automation, and feeling AI supports relationalization [6]. Davenport and colleagues similarly argue that AI will transform marketing strategy across intelligence levels and task types, while cautioning that it performs best when it augments rather than replaces human managers [3].

Firm-level evidence is accumulating. Work on personalized engagement marketing describes how AI curates otherwise overwhelming choice for individual consumers, narrows information, and effectively reorders the customer journey in both developed and developing markets [7]. A study of US-listed firms finds that a stronger AI focus, measured from corporate filings, is associated with improvements in net profitability, net operating efficiency, and returns on marketing-related investment [8]. Taken together, this stream suggests that AI-powered personalization functions simultaneously as a marketing instrument that shapes consumer experience and as a driver of firm performance, which is why global brands increasingly treat it as a board-level topic rather than a channel tactic.

2.3. Personalization, consumer response, and brand outcomes

Consumer research has begun to document how personalized digital experiences translate into brand-level outcomes. In the beauty category, virtual try-on (VTO) technology built on augmented reality (AR) allows shoppers to preview cosmetics on their own faces before purchase; survey evidence from Indonesia shows that AR content quality and service quality raise purchase intention through the mediation of brand trust, indicating that the experiential and relational effects of AR are at least as important as its informational function [9]. AI-based diagnostics extend personalization from simulation to measurement. An algorithm developed by L'Oréal researchers, which grades facial signs from selfie images, was validated against assessments by 50 dermatologists across a diverse sample of 1,041 women in the United States and achieved strong correlations for most signs [10]. Related conceptual work argues that the next generation of AI marketing applications should incorporate artificial empathy, so that automated interactions do not feel cold to consumers and can bridge the gap in affective and social customer experience [11].

Personalization also operates through human intermediaries. Online influencer marketing leverages the follower networks, personal positioning, communication content, and follower trust accumulated by influencers to make brand communication feel individual and authentic [12]. Because followers perceive influencer content as personal recommendation rather than as advertising, this channel complements algorithmic personalization in ways that pure brand messaging cannot easily replicate [12]. For a multi-brand group, influencers therefore function as a human personalization layer that can be tuned by brand, segment, and platform.

2.4. Ethical tensions and research gap

The literature is nonetheless candid about the costs of personalization. AI-driven marketing raises policy questions concerning privacy, bias, and ethics, and these questions intensify when the data

involved are biometric [3]. A recent case study of L'Oréal's AI-driven hairdressing services identifies algorithmic bias that may lead to exclusionary recommendations, manipulative personalization practices, reduced consumer autonomy, and the digital exclusion of consumers with low digital literacy or limited access to technology as salient ethical concerns [13]. These findings echo the older insight that consumer sacrifices, above all privacy risk, are built into personalization from the start [5].

Three observations motivate the present study. First, the literature remains fragmented between firm-level analyses of AI capability and performance [6-8] and consumer-level studies of specific technologies such as AR try-on or conversational agents [9-11]. Second, large corporate implementations that span diagnostics, VTO, customer relationship management (CRM), and influencer communication are rarely examined as an integrated system, even though consumers encounter them as a single brand experience. Third, the beauty industry, where product-individual fit matters exceptionally but is hard to verify, is underrepresented in mainstream marketing scholarship despite being an early adopter of AR and AI. This paper addresses these gaps through a case study of L'Oréal.

3. Methodology

The study employs an exploratory, qualitative, single-case design. Such a design is suitable when a contemporary phenomenon has to be examined within its real organizational context, when the researcher relies on documentary rather than experimental evidence, and when the boundaries between phenomenon and context are blurred. L'Oréal was selected as a revelatory case because it is the global market leader in beauty, has articulated an explicit Beauty Tech strategy for several years, and discloses unusually rich information about its digital operations in audited and official publications [4].

Data were drawn from four types of secondary sources. First, the group's 2024 annual report, annual results release, and investor communications provided financial and organizational facts [4]. Second, official press releases documented strategic decisions, notably the acquisition of the AR specialist ModiFace [14]. Third, peer-reviewed publications authored or co-authored by the company's own researchers documented the scientific validation of its diagnostic algorithms [10]. Fourth, industry research on personalization practice supplied comparative context [2]. The documents were read iteratively and coded inductively around four themes that emerged from the literature: data infrastructure and diagnostics, virtual try-on, omnichannel CRM, and personalized content. Triangulation across source types was used to reduce single-source bias, and all quantitative figures reported below were taken from audited or official corporate disclosures.

Two limitations of the design are acknowledged at the outset. Secondary data cannot fully capture internal decision processes, and a single case does not support statistical generalization. The aim of the analysis is analytical generalization to concepts and frameworks rather than to populations, and the findings should be read accordingly.

4. Case background

L'Oréal, headquartered in Clichy, France, has been devoted to beauty for more than a century and today sells the products of 37 international brands in more than 150 countries [4]. In 2024, the group achieved sales of EUR 43.48 billion, representing growth of 5.1% like-for-like and 5.6% reported, reached a record operating margin of 20.0%, and employed more than 90,000 people worldwide [4]. The portfolio spans four divisions, namely Consumer Products, Luxe, Dermatological Beauty, and

Professional Products, covering mass-market and premium price points across skincare, make-up, haircare, fragrance, and hair colour [4]. This breadth matters analytically, because any personalization capability that is shared across 37 brands must work across very different price tiers, cultures, and distribution formats.

The group's digital transformation accelerated in the second half of the 2010s. A milestone was the acquisition in March 2018 of ModiFace, a Toronto-based company founded by Parham Aarabi, which had developed leading technologies for three-dimensional virtual make-up, hair colour simulation, and skin diagnosis, had submitted more than 200 scientific publications, held over thirty patents, and employed around seventy engineers, researchers, and scientists [14]. Rather than licensing such tools from vendors, L'Oréal integrated ModiFace into a dedicated Digital Services Factory, a network designed to build digital services for all of the group's brands on proprietary technology [14]. By 2024, the group employed approximately 8,000 digital, technology, and data specialists alongside more than 4,000 scientists, ranked as the world's fourth-largest advertiser, and reported more than 110 million uses of its Beauty Tech services [4]. Table 1 summarizes the key indicators of the company's digital marketing environment.

Table 1. Selected indicators of L'Oréal's digital marketing environment in 2024

Indicator	Value in 2024
Group sales	EUR 43.48 billion (+5.1% like-for-like)
E-commerce sales	EUR 12.3 billion (28.2% of consolidated sales)
Operating margin	20.0% of sales
Global brands / countries	37 brands sold in more than 150 countries
Digital, technology and data experts	about 8,000 employees
Uses of Beauty Tech services	more than 110 million
Advertising scale	4th largest advertiser worldwide

The figures in Table 1 indicate that L'Oréal combines the scale of a fast-moving consumer goods group with the digital intensity of an e-commerce retailer. Nearly three tenths of consolidated sales are already transacted online, and the volume of Beauty Tech service usage suggests that digital tools have become a routine part of how consumers meet the group's brands rather than a novelty [4].

5. Findings and analysis

The analysis identifies four touchpoint clusters through which L'Oréal personalizes the consumer journey, supported by three AI capability layers and constrained by ethical boundary conditions. Figure 1 summarizes this structure by adapting the mechanical-thinking-feeling AI framework to the case evidence [6].

Capability layer

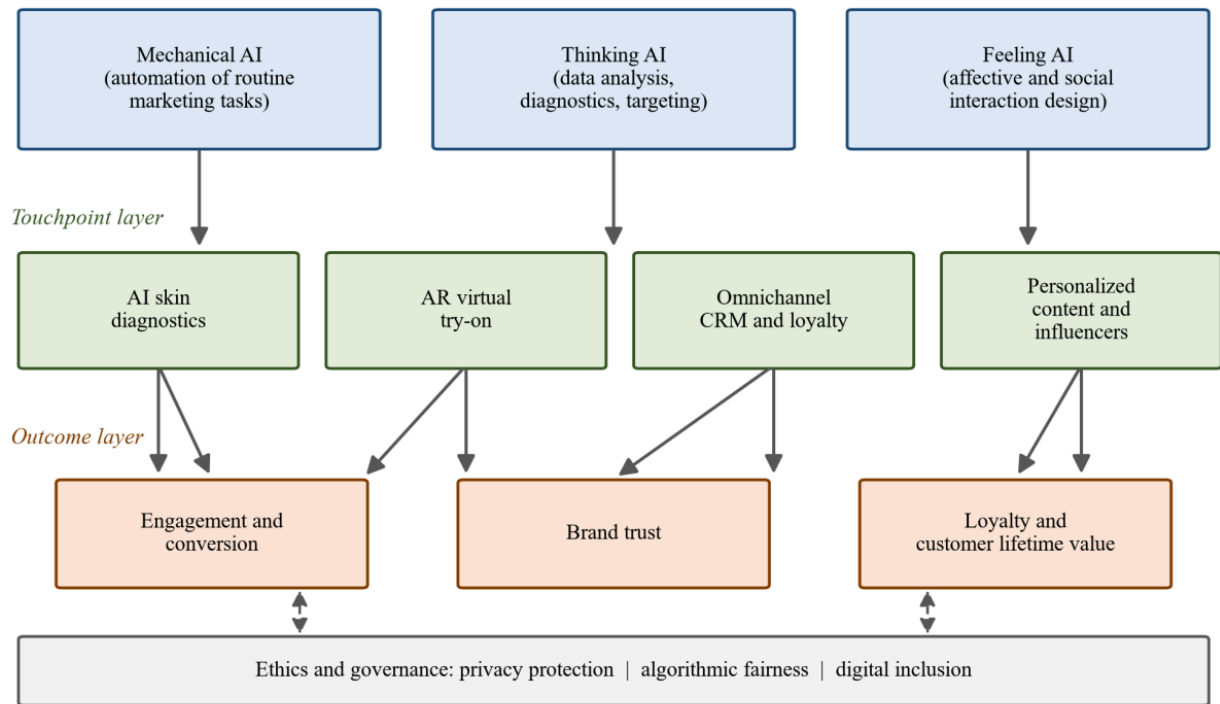


Figure 1. An integrated framework of L'Oréal's personalization strategy (adapted from the AI capability framework [6])

5.1. Data infrastructure and AI-based diagnostics

The foundation of the strategy is the conversion of consumer data into individual insight. E-commerce transactions, brand applications, loyalty programmes, and diagnostic sessions generate behavioural and physiological signals that feed recommendation engines operating across the group's brand portfolio. Consistent with the thinking AI role is to process data into decisions [6], these systems move beyond demographic segments toward individual-level product routines, so that two consumers visiting the same brand site can receive different routines, sequences, and offers based on their histories and diagnostic results.

Skin diagnostics illustrate the approach most clearly. Tools of the SkinConsult AI type analyse a selfie, grade several facial signs automatically, and return a personalized skincare routine together with product recommendations. The scientific credibility of such diagnostics has been tested formally rather than asserted: in a cross-sectional study of 1,041 women in the United States, the algorithm's gradings correlated strongly with the assessments of 50 dermatologists for five of seven facial signs, although agreement was weaker for pigmentation signs on the darkest skin tones [10]. Validation of this kind serves marketing directly, because a recommendation grounded in a clinically benchmarked measurement is more defensible than one derived from a short questionnaire, and it simultaneously exposes an inclusion problem, since weaker accuracy for darker skin tones implies that some consumer groups receive systematically less reliable personalization [10]. The company's own scientists publish this validation work in dermatology journals, which turns a technical quality-control exercise into a public trust signal.

5.2. Augmented reality virtual try-on across the consumer journey

The second cluster restores a version of try-before-you-buy to digital channels. ModiFace's technology allows consumers to try make-up, hair colour, and related products virtually on their own faces, and it has been deployed on brand websites, e-retailer platforms, social media, and in-store screens [14]. For an experience good whose fit is normally verified at a cosmetics counter, AR try-on reduces the perceived risk of online purchase and lowers the cost of exploring alternatives. Survey evidence from an independent market indicates that the quality of such AR experiences raises purchase intention through the mediation of brand trust, which suggests that virtual try-on builds a relational asset and not merely a convenience [9].

Scale changes the economics of this touchpoint. With more than 110 million uses of Beauty Tech services reported in 2024 [4], the try-on layer doubles as a data-collection mechanism: every session records preferences, shades, and abandonments, and these signals feed back into recommendation models, closing the learning loop envisioned in the personalized engagement marketing literature [7]. Virtual sampling may also substitute for physical testers, which aligns the personalization agenda with the group's sustainability positioning and reduces waste in the product discovery process [4]. In this sense, AR try-on is simultaneously a conversion tool, a research instrument, and a sustainability practice.

5.3. Omnichannel CRM and loyalty personalization

The third cluster manages the relationship over time. With 28.2% of consolidated sales generated online [4], the group maintains consumer relationships across owned e-commerce sites, pure players, retailer platforms, brand applications, and physical counters. Mechanical AI automates routine interactions such as replenishment reminders, service messages, and loyalty communications, while CRM systems consolidate purchase histories and service records into a single consumer view that follows the individual across channels [6, 7]. The strategic intent, articulated in the group's reporting, is a harmonized and personalized experience regardless of where the consumer meets the brand [4]. The case evidence suggests that omnichannel consistency is what converts isolated personalized moments into a durable relationship, because diagnostics performed in one channel reappear as recommendations and services in another.

5.4. Personalized content, influencers, and social commerce

The fourth cluster concerns what consumers actually see and hear. Content is tailored to segments, platforms, and occasions, and influencers act as trust-bearing intermediaries whose recommendations are perceived by followers as personal advice rather than as advertising [12]. The group's position as one of the world's largest advertisers gives it the scale to combine algorithmic targeting with human-mediated authenticity [4], and its conversational services increasingly incorporate affective design considerations of the kind described in the artificial empathy literature [11]. This mix matters because purely algorithmic personalization can feel surveillant, whereas influencer-mediated personalization feels chosen; the two mechanisms therefore complement rather than substitute for each other.

5.5. Organizational enablers

The case highlights three organizational enablers behind the four touchpoint clusters. The first is in-house ownership of core technology: by acquiring ModiFace rather than renting equivalent services, L'Oréal secured control of its AR and AI stack and embedded it in a Digital Services Factory that serves all brands, which shortens deployment cycles and keeps consumer data within the group [14]. The second is talent: approximately 8,000 digital, technology, and data specialists complement the marketing organization and anchor the required skills internally [4]. The third is the governance bridge between marketing and research, exemplified by validation studies published by the company's scientists in peer-reviewed journals [10]. These observations align with firm-level evidence that AI orientation is associated with superior profitability and marketing returns [8], and with the argument that AI creates most value when it augments human marketers rather than replaces them [3].

5.6. Tensions: privacy, bias, and digital exclusion

The same mechanisms that create value generate risks. Facial images constitute sensitive biometric data, so diagnostic and try-on services operate under strict data-protection expectations, and transparency as well as consent are preconditions of consumer trust in AI-driven journeys [13]. Algorithmic bias is a second tension: the weaker diagnostic agreement for darker skin tones documented in validation research [10] echoes the concern that personalization systems may serve some consumer groups less well than others, which is ethically problematic and commercially self-defeating for a group whose growth increasingly depends on diverse markets [4, 13]. Third, AI-driven personalization may reduce consumer autonomy through overly curated choice or exclude consumers with limited digital literacy and technology access [13]. Within the case, these tensions are treated not as external criticism but as boundary conditions that the firm actively manages through scientific validation, inclusive design programmes, and published commitments to responsible AI [4, 10].

6. Discussion

Returning to the research questions, the findings show that L'Oréal operationalizes personalization through four interlocking touchpoint clusters, namely diagnostics, virtual try-on, omnichannel CRM, and personalized content, rather than through any single tool. The underlying capability combines data infrastructure, proprietary AI and AR technology, and organizational structures that connect data science with brand management. The tensions accompanying these initiatives confirm the older conceptual insight that personalization is a managed balance between relevance and intrusion, in which consumer benefits and sacrifices are two sides of the same coin [5].

The case extends prior theory in three ways. First, it shows concretely how mechanical, thinking, and feeling AI map onto the operations of a global brand: automation dominates CRM and service communication, analysis dominates diagnostics and targeting, and affective design is emerging in conversational services [6, 11]. Second, it connects the firm-level and consumer-level strands of the literature, because the group's sustained margin performance alongside documented consumer-response mechanisms such as AR-driven brand trust [9] is consistent with the claim that AI focus improves firm performance and marketing returns [8]. Third, it demonstrates that scientific validation can function as a marketing asset, since a dermatology study becomes a trust signal for

personalized recommendations, an integration that is rarely described in the personalization literature [5, 6].

For managers, three lessons emerge from the case. Owning core personalization technology, as in the ModiFace acquisition, secures strategic control, brand-wide scalability, and data governance in one step [14]. Investing in formal validation addresses the credibility and inclusion problems that undermine many consumer-facing AI services, and publishing the results converts a cost into a differentiator [10]. Finally, privacy protection, bias monitoring, and attention to digitally excluded consumers should be designed into personalization programmes from the outset rather than retrofitted after failures, because trust is the currency that makes repeated personalized interaction acceptable to consumers [13].

7. Conclusion

This paper has examined how brand personalization is strategized and implemented in a digital marketing environment through a case study of L'Oréal. The evidence shows a coherent architecture in which AI-based diagnostics, AR virtual try-on, omnichannel CRM, and influencer-mediated content are combined under an explicit Beauty Tech strategy, supported by proprietary technology, a large digital workforce, and scientific validation of consumer-facing algorithms. The company's 2024 results, including a record operating margin of 20% and 28.2% of sales transacted online, indicate that this architecture is commercially viable at global scale [4].

The study contributes an integrated framework that links AI capability layers, personalization touchpoints, and brand outcomes under ethical boundary conditions, and it illustrates the value of triangulating corporate, technical, and consumer-level evidence when studying digital marketing strategy. Several limitations remain: the analysis rests on secondary data and a single case, the most recent initiatives have not yet produced independently measurable consumer outcomes, and no causal claims about individual consumer behaviour are made. Future research should test the proposed framework quantitatively, compare L'Oréal with digital-native beauty brands that lack physical distribution, and examine how generative AI reshapes the creation of personalized content at brand scale.

References

- [1] Kannan, P. K., & Li, H. A. (2017). Digital marketing: A framework, review and research agenda. *International Journal of Research in Marketing*, 34(1), 22-45.
- [2] Arora, N., Ensslen, D., Fiedler, L., Liu, W. W., Robinson, K., Stein, E., & Schöler, G. (2021, November 12). The value of getting personalization right—or wrong—is multiplying. *McKinsey & Company*. <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-value-of-getting-personalization-right-or-wrong-is-multiplying>
- [3] Davenport, T., Guha, A., Grewal, D., & Breussgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, 48(1), 24-42.
- [4] L'Oréal (2025). 2024 annual report. *L'Oréal Group*. <https://www.loreal-finance.com/en/annual-report-2024/>
- [5] Vesänen, J. (2007). What is personalization? A conceptual framework. *European Journal of Marketing*, 41(5/6), 409-418.
- [6] Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, 49(1), 30–50.
- [7] Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *California Management Review*, 61(4), 135–155.
- [8] Mishra, S., Ewing, M. T., & Cooper, H. B. (2022). Artificial intelligence focus and firm performance. *Journal of the Academy of Marketing Science*, 50(6), 1176–1197.

- [9] Dhianita, S., & Rufaidah, P. (2024). The role of virtual try-on augmented reality of cosmetic products on purchase intention mediated by brand trust. *Jurnal Manajemen Bisnis*, 11(2), 1111–1123.
- [10] Flament, F., Jiang, R., Houghton, J., Zhang, Y., Kroely, C., Jablonski, N. G., Jean, A., Clarke, J., Steeg, J., Sehgal, C., McParland, J., Delaunay, C., & Passeron, T. (2023). Accuracy and clinical relevance of an automated, algorithm-based analysis of facial signs from selfie images of women in the United States of various ages, ancestries and phototypes: A cross-sectional observational study. *Journal of the European Academy of Dermatology and Venereology*, 37(1), 176–183.
- [11] Liu-Thompkins, Y., Okazaki, S., & Li, H. (2022). Artificial empathy in marketing interactions: Bridging the human-AI gap in affective and social customer experience. *Journal of the Academy of Marketing Science*, 50(6), 1198–1218.
- [12] Leung, F. F., Gu, F. F., & Palmatier, R. W. (2022). Online influencer marketing. *Journal of the Academy of Marketing Science*, 50(2), 226–251.
- [13] Hernik, J., Jarecki, W., Grinberga-Zalite, G., & Muntean, A. (2025). Ethical challenges in AI-driven consumer journey: A case study of L'Oréal's hairdressing services. In *Intelligent management and artificial intelligence: Trends, challenges, and opportunities*. Acta Iuris Stetinensis, 367–383.
- [14] L'Oréal. (2018, March 16). L'Oréal acquires ModiFace, further expanding its worldwide expertise in beauty tech. *L'Oréal Group*. <https://www.loreal.com/en/news/finance/l'or%C3%A9al-acquires-modiface-further-expanding-its-worldwide-expertise-in-beauty-tech/>