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CHALLENGES AND PROSPECTIVE FUTURE OF ARTIFICIAL INTELLIGENCE AND ITS AMBITIOUS CONTRIBUTION IN MARKETING APPLICATIONS ACCORDING TO SAUDI VISION 2030

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Abstract

Artificial intelligence (AI) is no longer an experimental tool in marketing; it has become a central driver of personalization, predictive analytics, and customer engagement. In Saudi Arabia, AI plays a particularly important role within Vision 2030, the Kingdom's blueprint for economic diversification and digital transformation. This review brings together global insights on AI in marketing and situates them within Saudi Arabia's unique policy and market context.

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Evidence shows that AI is transforming e-commerce, retail, tourism, finance, and healthcare, supported by national initiatives such as the Saudi Data and Artificial Intelligence Authority (SDAIA). Yet, the pace of adoption is uneven. Challenges related to technical readiness, organizational structures, ethical concerns, cultural sensitivities, and workforce skills continue to limit broader implementation, especially among small and medium-sized enterprises (SMEs). By comparing Saudi Arabia's progress with experiences in the United States, China, the UAE, and Europe, this review identifies key lessons and practical recommendations. It argues that AI in marketing will be essential not only for advancing Vision 2030 but also for positioning Saudi Arabia as a regional leader in digital innovation.

Keywords: Artificial Intelligence (AI); Marketing; Saudi Vision 2030; Digital Transformation; Consumer Trust

1. Introduction

Artificial Intelligence (AI) soon shifted from a disruptive technology to a business transformation necessity in industries. In the marketing space, AI is no longer a science fiction phrase but a reality as a utility to track consumer behavior, predict market direction, and create hyper-personal experiences at scale. Globally, businesses are using AI as a part of their marketing strategy more than ever before to automate decisions, optimize marketing campaigns, and create more meaningful customer connections [1]. Unlike the traditional marketing that relied on historical data and managerial intuition, AI uses advanced algorithms, real-time processing, and NLP to provide actionable insights that redefine the consumer–brand relationships dynamics [2].

Saudi Arabia is one of the most ambitious AI adopters, incorporating it within its national development strategy through Vision 2030. The long-term plan, launched in 2016, seeks to diversify the economy beyond oil, create innovation-based industries, and establish the Kingdom as a global center for technology and digital transformation [3]. AI was identified as a pillar of such vision, particularly in areas such as e-commerce, tourism, financial institutions, and health marketing. The establishment of the Saudi Data and Artificial Intelligence Authority (SDAIA) in 2019 further cemented the Kingdom's ambitions for AI by creating national strategies, developing policies, and promoting AI-driven adoption within both public and private sectors [4]. This institutional backing places Saudi Arabia among the leading Middle Eastern nations in terms of supporting AI innovation against national development agendas.

The marketing space is a very promising field for AI deployment in Vision 2030. For one, Saudi Arabia has a youth, digitally savvy population with over 70% of its citizens under the age of 35 and possessing one of the highest smartphone penetration levels in the world [5]. This population profile offers ample scope for AI-enabled personalization, predictive analytics, and interactive customer experiences. Second, the patronage of entrepreneurship and digital innovation by the government provides firms with incentives to experiment with AI-powered marketing solutions. Platforms such as Noon, Jarir, and Namshi increasingly leverage AI to provide personalized recommendations, streamline online promotions, and maintain customer information under control. Finally, sectors prioritized in Vision 2030 such as tourism, healthcare, and financial services have integrated AI into their marketing efforts to enhance competitiveness and develop global appeal [6], [7].

However, bringing AI into marketing across Saudi Arabia isn't exactly smooth sailing. There are still quite a few technical hurdles to overcome. Problems like scattered data that doesn't talk to each other, systems that can't work together properly, and basic infrastructure that just

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isn't up to scratch are stopping AI from doing what it's really capable of. Then there's the organizational side of things - many of the smaller businesses that really drive Saudi Arabia's economy simply don't have the money or the know-how to get on board with AI technology. Looking at the bigger picture, there are growing concerns around rules and doing the right thing. Saudi customers really care about being able to trust companies and keeping their personal information safe, which brings up some tough questions about whether AI marketing systems are fair to everyone, whether people can understand how they work, and who's responsible when things go wrong. These difficulties highlight how crucial it is to match AI applications with regional cultural norms, customer demands, and developing legal frameworks.

From an academic perspective, the integration of AI into Saudi Arabia's marketing ecosystem opens new research frontiers. While global literature has extensively examined the role of AI in personalization, advertising, and predictive modeling, relatively few studies systematically assess these applications within the Saudi context as shown in figure 1. Moreover, existing studies often remain descriptive rather than analytical, overlooking empirical evaluations of AI's actual impact on consumer trust, firm performance, or sectoral competitiveness [11], [12]. Addressing these gaps is essential for developing both theoretical and practical insights that can guide policymakers, practitioners, and researchers in maximizing AI's contribution under Vision 2030.

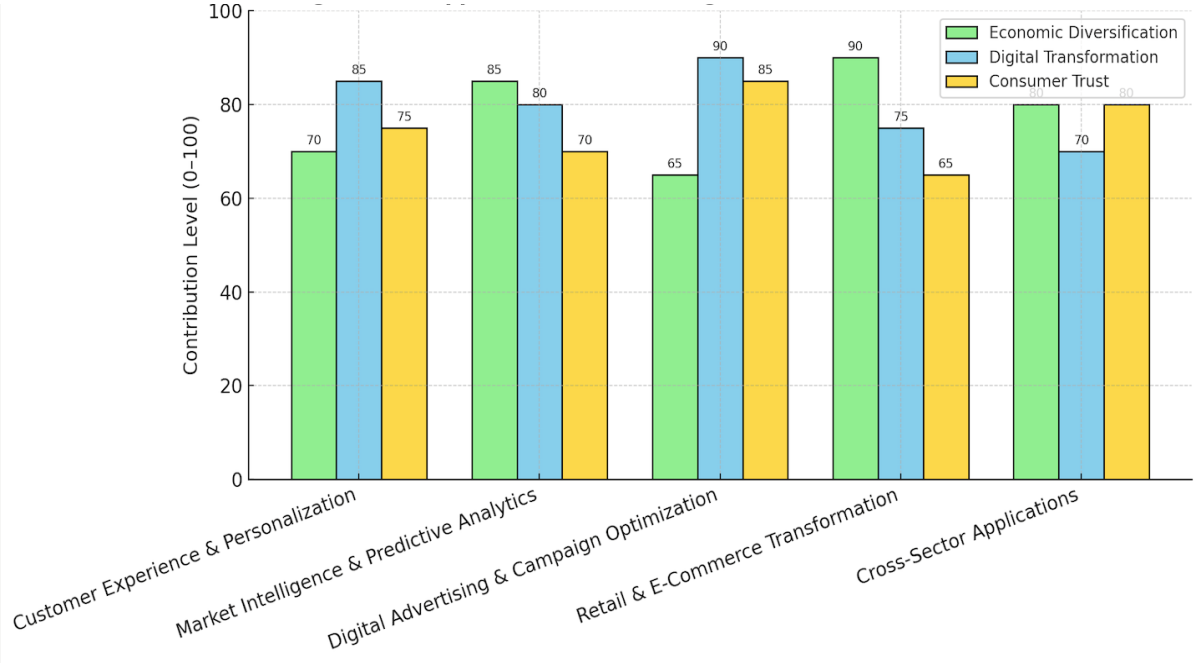

Figure 1. Al Applications in Marketing and Their Contribution to Vision 2030

The significance of this paper lies in its dual focus: synthesizing global knowledge on AI in marketing while contextualizing it within Saudi Arabia's national transformation agenda. By reviewing literature across multiple domains, this study identifies the opportunities AI presents for marketing innovation, the challenges hindering adoption, and the future prospects for sustainable integration. In doing so, it contributes to a deeper understanding of how AI can serve not only as a technological tool but also as a strategic enabler of national development.

2. Literature review

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The use of artificial intelligence (AI) in marketing has garnered a lot of attention from academics; applications range from digital advertising and consumer engagement to personalization and predictive analytic. Researchers have also looked at the specific function AI plays in Saudi Arabia's Vision 2030 goal and how its adoption is incorporated into national transformation efforts. In order to lay the groundwork for the current study, this part examines these literary threads, combining national-level tactics, international events, and the Saudi setting.

2.1 Global Perspectives on AI in Marketing

One of the industries with the fastest adoption of AI has been marketing, where businesses use sophisticated data to gain a competitive edge. AI applications in marketing include campaign optimization, consumer behavior prediction, and customer relationship management (CRM) on a global scale. Zhang et al. [13] showed how machine learning improves the efficacy of targeted marketing by enabling more accurate segmentation than conventional statistical techniques. According to Wamba-Taguimdje et al. [14], AI improves business performance by automating decision-making procedures and facilitating real-time, personalized consumer interaction.

AI has a special impact on how personalization tactics are developed. Davenport et al. [15] demonstrated how chatbots and recommendation engines driven by AI may tailor consumer experiences on e-commerce and retail platforms. Ameen et al. [16] cautioned, however, that relying too much on automation may diminish customer interactions' authenticity and jeopardise customer trust. This conflict highlights AI's dual function as a source of ethical and interpersonal issues as well as a driver of efficiency and personalization.

AI systems support programmatic advertising in digital advertising, where algorithms evaluate user data to optimize real-time ad placement bids [17]. Chatterjee et al. [18] came to the conclusion that AI-driven advertising increases target efficiency and ROI. Verma and Singh [19] highlighted the moral conundrums surrounding AI in advertising, pointing out that consumers are becoming increasingly concerned about data privacy and surveillance. These results emphasize the necessity of striking a balance between measures for fostering trust and technological progress.

2.2 AI within National Transformation Strategies

Globally, AI is becoming more widely acknowledged as a strategic instrument for national development agendas. In the United States, the National AI Initiative Act of 2020 provides a coordinated federal framework for advancing AI research, commercialization, and workforce development [20]. In China, the 2017 “Next Generation AI Development Plan” positioned AI as a strategic priority, with a target of becoming the world leader in AI innovation by 2030 [21]. Both cases illustrate how governments are embedding AI within their long-term economic strategies, including applications in marketing and digital commerce.

The United Arab Emirates (UAE) offers a particularly relevant regional comparison. In 2017, the UAE launched its National AI Strategy 2031, becoming the first Arab nation to appoint a Minister of State for Artificial Intelligence. Al-Khouri [22] argued that AI adoption in the UAE’s public and private sectors reflects not only technological advancement but also institutional commitment. Alshurideh et al. [23] documented how AI applications in retail and tourism enhanced competitiveness, international branding, and consumer engagement.

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From a theoretical perspective, Dwivedi et al. [24] suggest that AI adoption has become a strategic necessity rather than a discretionary choice, as nations link technological transformation with global competitiveness. However, Floridi [25] cautions against technological dependency, emphasizing the risks when countries rely too heavily on imported AI systems without building indigenous innovation capacity. These debates are especially relevant for emerging economies like Saudi Arabia, which seek to balance rapid AI adoption with local capability development.

2.3 AI in Marketing under Saudi Vision 2030

Saudi Arabia's Vision 2030 situates AI at the core of its economic diversification agenda, making it one of the most ambitious national strategies for AI adoption globally. Within this framework, marketing emerges as a critical domain for AI integration, particularly in sectors such as e-commerce, tourism, finance, and healthcare.

Alqahtani and Uslay [26] examined digital marketing in Saudi Arabia, finding that Vision 2030 initiatives have accelerated adoption of AI-based tools in major corporations, while small and medium-sized enterprises (SMEs) face barriers due to financial and human resource constraints. Similarly, Al-Fayez [27] highlighted the risks of over-reliance on foreign AI platforms (e.g., Amazon, Google, Alibaba), warning that such dependency may undermine the Kingdom's long-term innovation ecosystem.

In tourism marketing, Alghamdi [28] showed that AI enhances destination promotion through recommendation systems, predictive analytics, and customized travel itineraries. This aligns with Vision 2030's goal of making Saudi Arabia a leading global tourism hub. In retail, Al-Turki and Thomas [29] demonstrated how AI-driven personalization is reshaping customer experiences, particularly among younger Saudi consumers who demand culturally relevant digital interactions.

Nevertheless, challenges persist. Alzahrani [30] emphasized the need for stronger regulatory frameworks to address data privacy and consumer trust issues in AI marketing. The SDAIA 2022 report [31] further underscored the importance of developing local AI expertise, particularly in marketing and data analytics roles, to sustain adoption.

2.4 Research Gaps

Although the literature on AI in marketing is growing, three key gaps remain in the Saudi context:

1. Lack of empirical evidence: Most studies are conceptual or descriptive, with limited large-scale empirical research on how AI adoption impacts Saudi consumer behavior and firm performance.
2. Sectoral underrepresentation: Research has primarily focused on tourism and retail, while other Vision 2030 priority sectors such as healthcare, education, and financial services remain underexplored.
3. Comparative insights: Few studies benchmark Saudi Arabia's AI adoption against global leaders, despite the importance of learning from international best practices to accelerate national progress.

By addressing these gaps, this review contributes both theoretically and practically. It synthesizes fragmented research into a structured analysis, contextualizes AI adoption within Vision 2030, and identifies pathways for marketing innovation aligned with national priorities.

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Table 1. (Summary of Reviewed Literature on AI in Marketing and National Transformation Agendas)

Author(s), Year	Focus Area	Country/Context	Key Contribution	Relevance to Saudi Vision 2030
Zhang et al., 2021 [13]	AI in marketing applications and implications	Global	Demonstrated AI's role in segmentation and personalization	Provides global benchmarks for Saudi adoption
Wamba-Taguimdje et al., 2020 [14]	AI and firm performance	Global	Showed AI improves real-time engagement and decision-making	Reinforces AI as driver of competitiveness under Vision 2030
Davenport et al., 2021 [15]	AI-powered personalization in retail	Global	Highlighted recommendation systems and chatbots	Relevant for Saudi retail/e-commerce transformation
Ameen et al., 2022 [16]	Risks of over-automation in AI marketing	Global	Warned about authenticity and trust issues	Highlights cultural trust challenges in Saudi context
Chatterjee et al., 2022 [18]	AI in digital advertising	Global	Found AI improves ROI in programmatic ads	Relevant to Saudi firms adopting digital campaigns
Verma & Singh, 2022 [19]	Privacy concerns in AI-driven marketing	Global	Examined ethical issues in consumer data use	Links to Saudi consumer privacy expectations
U.S. Congress, 2020 [20]	National AI Initiative Act	USA	Coordinated federal AI policy	Benchmark for Saudi national AI governance
Government of China, 2017 [21]	Next Generation AI Development Plan	China	Set roadmap for AI global leadership by 2030	Similar ambition to Vision 2030
Al-Khouri, 2021 [22]	AI adoption in UAE	UAE	Discussed prospects and challenges in Arab context	Regional reference for Saudi AI adoption
Alshurideh et al., 2021 [23]	AI in retail and tourism	UAE	Documented impacts on competitiveness and branding	Lessons for Saudi tourism/retail marketing

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Author(s), Year	Focus Area	Country/Context	Key Contribution	Relevance to Saudi Vision 2030
Dwivedi et al., 2021 [24]	AI as strategic necessity	Global	Positioned AI as integral to competitiveness	Validates Vision 2030 emphasis on AI
Floridi, 2021 [25]	Risks of technological dependency	Global	Warned against over-reliance on foreign AI	Highlights need for Saudi local innovation
Alqahtani & Uslay, 2022 [26]	Digital marketing transformation	Saudi Arabia	Showed opportunities & challenges under Vision 2030	Direct insight into Saudi context
Al-Fayez, 2023 [27]	AI and innovation ecosystems	Saudi Arabia	Highlighted risks of imported tech dependence	Suggests Saudi need for local AI solutions
Alghamdi, 2022 [28]	AI in tourism marketing	Saudi Arabia	Demonstrated role of AI in promoting tourism	Aligns with Vision 2030 tourism diversification goals
Al-Turki & Thomas, 2023 [29]	AI personalization in retail	Saudi Arabia	Explored AI strategies for consumer engagement	Highlights Saudi cultural relevance
Alzahrani, 2023 [30]	AI regulation and privacy	Saudi Arabia	Examined consumer trust issues	Critical for Saudi AI marketing policy
SDAIA, 2022 [31]	AI workforce development	Saudi Arabia	Addressed human capital challenges	Directly supports Vision 2030 AI capacity building

3. AI Applications in Marketing under Saudi Vision 2030

Artificial Intelligence (AI) is reshaping marketing practices in Saudi Arabia, directly supporting the ambitions of Vision 2030. By enabling personalization, predictive analytics, advertising optimization, and cross-sector innovation, AI strengthens the competitiveness of Saudi firms and enhances consumer experiences. This section outlines how AI is currently applied across major marketing domains under the Vision 2030 framework.

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3.1 Customer Experience and Personalization

One of the most visible contributions of AI to marketing is its ability to transform the customer experience. Recommendation systems powered by machine learning analyze consumer purchase histories, browsing behavior, and demographic attributes to deliver individualized product suggestions. Zhang et al. [32] demonstrated that such systems improve customer retention and conversion rates by anticipating consumer needs more accurately than traditional segmentation methods.

Saudi e-commerce platforms such as Noon and Namshi have incorporated these AI-driven personalization tools to strengthen their competitive positioning in the Gulf region [33]. Chatbots and conversational AI systems, capable of processing Arabic and English interactions, also enhance customer support. Previous Studies indicate that young Saudi consumers increasingly used AI-enabled customer service for its efficiency, immediacy, and cultural adaptability [34]. These usages of AI align with Vision 2030's goal of enhancing quality of life by implementing innovation into everyday consumer interactions.

3.2 Market Intelligence and Predictive Analytics

By offering real-time insights into customer behavior, market trends, and brand perception, artificial intelligence (AI) improves market intelligence. Specifically, predictive analytics aids in strategic decision-making through demand forecasting, pricing optimization, and marketing effectiveness evaluation. According to Wamba-Taguimdje et al. [35], predictive models greatly enhance businesses' capacity to foresee changes in the market and deploy resources efficiently.

One of the main tenets of Vision 2030 in the Saudi tourist industry is the use of AI-powered predictive analytics to forecast visitor flows during major events like Jeddah Formula 1 and Riyadh Season. Tourism authorities can create targeted campaigns and make real-time adjustments to promotional activities by combining booking data, sentiment on social media, and macroeconomic indicators [36]. Similar to this, AI-powered dynamic pricing algorithms in retail assist businesses maximize profits while maintaining their competitiveness [37].

3.3 Digital Advertising and Campaign Optimization

Digital advertising has been transformed by AI, especially with programmatic advertising systems that use real-time data to automate ad placements. Programmatic advertising ensures that messages reach the right audience at the right moment, which greatly increases efficiency, according to Kaplan and Haenlein [38].

AI-enabled campaigns have become more and more popular among Saudi banking and telecom companies, which use predictive targeting to tailor ads according to customer demographics and usage trends [39]. By testing Arabic-language social media interactions, natural language processing (NLP) helps businesses scale reaction and cultural resonance, which further enhances advertising [40]. These processes and implementations support the goal of Vision 2030, to be achieved by creating digital sectors and increasing customer confidence in digital platforms.

3.4 Retail and E-Commerce Transformation

In Saudi Arabia, two of the industries most affected by AI are retail and e-commerce. By 2025, the Kingdom's e-commerce market is expected to grow to a value of over USD 20 billion [41], driven by the digital transformation objective of Vision2030.

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AI-powered solutions for inventory management, predictive restocking, and personalized suggestions have been implemented by retailers including Jarir and Extra. These tools promote more flexible supply chain operations and lessen the chance of stockouts during periods of strong demand [42]. Simultaneously, the Saudi market is testing immersive technologies like virtual reality (VR) and augmented reality (AR) to improve the shopping experience by enabling customers to virtually try things before buying [43]. These uses show how AI in retail supports both customer engagement and the larger Vision 2030 goal of encouraging entrepreneurship and innovation-driven commerce.

3.5 Cross-Sector Applications

Applications of AI-driven marketing are not just found in e-commerce and retail. AI is being used by a number of Vision 2030 key areas to improve brand positioning and consumer engagement:

- Tourism: AI-powered platforms generate personalized travel itineraries, optimize hotel pricing, and deliver multilingual campaigns to attract global visitors [36].
- Financial Services: Banks and fintech firms use AI for targeted product marketing, fraud detection, and personalized financial advice [44].
- Healthcare: Hospitals and private clinics employ AI-enabled chatbots for patient engagement, while predictive analytics supports marketing of preventive care and wellness services [45].

Together, these applications reflect Saudi Arabia's holistic approach to embedding AI across sectors, making marketing a strategic driver of economic diversification. The reviewed applications demonstrate that AI in marketing is more than a technological enhancement it is a strategic enabler of Vision 2030's transformation goals. By strengthening personalization, analytics, and cross-sector engagement, AI contributes to both consumer satisfaction and national competitiveness. However, adoption remains uneven. While large corporations and multinational firms lead the way, small and medium-sized enterprises (SMEs) often lack the resources to implement AI solutions effectively [26], [27]. Bridging this gap will require continued government support, local capacity building, and targeted incentives to ensure AI adoption in marketing is inclusive and sustainable.

Table 2. AI Applications in Marketing Domains under Vision 2030

Marketing Function	AI Techniques	Benefits	Example Cases
Customer Experience & Personalization	Machine learning, chatbots, NLP	Tailored offers, faster service, improved loyalty	Noon, Namshi [32–34]
Market Intelligence & Predictive Analytics	Predictive modeling, sentiment analysis	Demand forecasting, dynamic pricing, performance insights	Saudi Tourism Authority [35–37]
Digital Advertising & Optimization	Programmatic Advertising, NLP	Higher ROI, targeted campaigns, cultural resonance	STC, Saudi banks [38–40]

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Marketing Function	AI Techniques	Benefits	Example Cases
Retail & E-Commerce	Recommendation systems, AR/VR, automation	Immersive shopping, supply chain efficiency, loyalty	Jarir, Extra [41–43]
Cross-Sector Applications	Multi-modal AI, predictive analytics	Sectoral growth, service innovation	Tourism, banks, healthcare [36], [44], [45]

4. Challenges of AI Adoption in Saudi Marketing

Despite the transformative potential of AI in marketing, adoption within Saudi Arabia is not without barriers. While Vision 2030 provides a strong strategic foundation, organizations face technical, organizational, regulatory, and cultural challenges that hinder seamless implementation. This section critically reviews these challenges, situating them in both global literature and the specific Saudi context as showed in figure 2.

4.1 Technical Challenges

The effectiveness of AI in marketing depends heavily on the quality of data and infrastructure. In Saudi Arabia, fragmented datasets and insufficient interoperability between platforms remain key barriers. Many organizations rely on siloed data systems, making it difficult to train AI algorithms effectively [46]. Inaccurate or incomplete consumer data can also lead to biased insights, undermining the reliability of predictive models.

Another technical limitation is the lack of advanced cloud and computing infrastructure in smaller firms. While large corporations like Saudi Telecom Company (STC) and major banks invest in AI-ready platforms, small and medium-sized enterprises (SMEs) often struggle with costs of hardware, software, and cybersecurity protections [47].

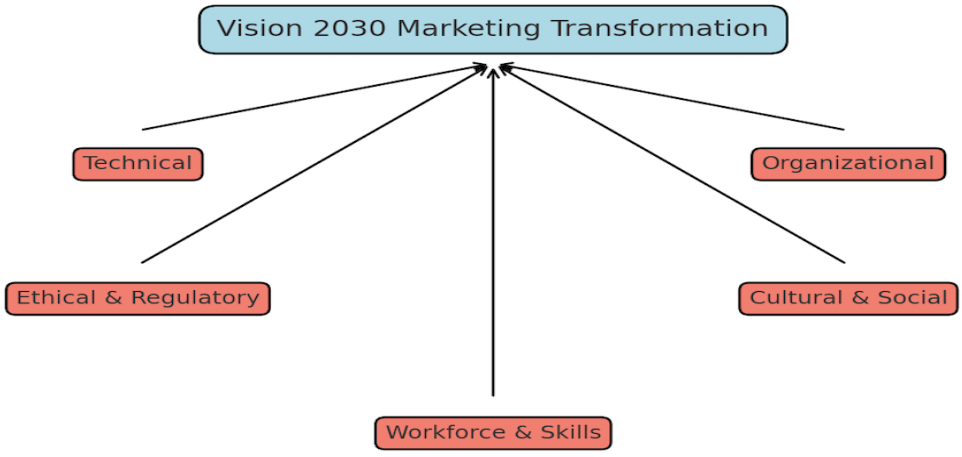

Figure 2. Challenge Categories and Their Link to Vision 2030 Goals

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4.2 Organizational Challenges

At the organizational level, resistance to change and limited managerial awareness present obstacles. Many business leaders still perceive AI as a high-risk investment with uncertain returns [48]. Moreover, SMEs which form 90% of registered businesses in Saudi Arabia often lack the financial resources to acquire AI solutions or the expertise to implement them. Alqahtani and Uslay [33] found that while Saudi corporations in e-commerce and finance are actively adopting AI, SMEs are considerably slower, widening the digital divide. This uneven adoption may hinder the Vision 2030 ambition of fostering an inclusive, innovative-driven economy.

4.3 Ethical and Regulatory Challenges

AI adoption in marketing also raises privacy and ethical concerns. Saudi consumers are highly conscious of data security and personal information sharing [40]. Alzahrani [40] reported that weak transparency in AI algorithms could reduce consumer trust, particularly when customers do not understand how their data is being used for targeted advertising.

Moreover, the regulatory framework governing AI and digital marketing in Saudi Arabia is still evolving. Although the Saudi Data and Artificial Intelligence Authority (SDAIA) has introduced guidelines on responsible AI use, enforcement mechanisms remain limited [49]. Without robust regulatory oversight, risks such as algorithmic bias, misuse of consumer data, and manipulation of consumer behavior could undermine the legitimacy of AI-driven marketing.

4.4 Cultural and Social Challenges

Cultural context plays a crucial role in consumer acceptance of AI. Saudi Arabia is characterized by strong traditions and cultural norms that may influence how AI-powered marketing is perceived. For instance, while younger generations readily embrace personalization, older consumers may distrust automated systems that seem to intrude on privacy or erode human interaction [50].

Language diversity also presents a challenge. NLP systems trained primarily on English data often struggle to process Arabic dialects effectively, leading to inaccuracies in sentiment analysis or chatbot responses [34]. Developing culturally and linguistically adaptive AI tools is therefore critical for success in Saudi Arabia.

4.5 Workforce and Skills Challenges

Human capital remains one of the most pressing obstacles. The AI talent gap is particularly visible in marketing, where demand for data scientists, AI engineers, and digital marketers with technical expertise far exceeds supply [31]. SDAIA's 2022 report highlighted the shortage of skilled professionals as a bottleneck for scaling AI adoption in the Kingdom.

While universities and training centers have begun to introduce AI-related programs, there remains a mismatch between academic curricula and industry needs [51]. Unless addressed, this talent shortage may slow down the pace of AI-driven marketing transformation.

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Table 3. Key Challenges of AI Adoption in Saudi Marketing

Challenge Category	Description	Saudi Context	Implications for Vision 2030
Technical	Fragmented datasets, lack of interoperability, limited cloud infrastructure [46-47]	SMEs unable to afford advanced platforms	Slows AI integration in retail/e-commerce
Organizational	Resistance to change, limited managerial awareness, high costs [33], [48]	SMEs lag behind corporations in adoption	Creates uneven digital transformation
Ethical/Regulatory	Privacy, algorithmic bias, evolving regulations [40], [49]	Weak enforcement of AI guidelines	Risks undermining consumer trust
Cultural/Social	Privacy concerns, language barriers in Arabic NLP [34], [50]	Older consumers are less receptive to automation	Hinders wide consumer acceptance
Workforce/Skills	Shortage of AI and data science talent [31], [51]	Misalignment between education and industry needs	Bottleneck for Vision 2030 capacity building

Taken together, these challenges illustrate that AI adoption in Saudi marketing is as much a socio-technical transformation as it is a technological one as showed in figure 3. Overcoming barriers requires not only investment in infrastructure but also stronger regulatory frameworks, cultural sensitivity, and workforce development. Vision 2030 provides a strong policy foundation, but unless these challenges are systematically addressed, the full potential of AI in marketing may remain underutilized.

5. Opportunities and Prospective Trends

While challenges in AI adoption persist, Saudi Arabia's Vision 2030 provides fertile ground for leveraging AI as a driver of marketing transformation. Opportunities arise not only from the Kingdom's unique demographic and economic conditions but also from institutional support and technological advancements. This section discusses these opportunities, situates them within Vision 2030's strategic pillars, and highlights future trends likely to shape AI-driven marketing in the Saudi context.

5.1 Expanding E-Commerce and Retail Innovation

By 2025, the e-commerce industry in Saudi Arabia is expected to reach a value of over USD 20 billion, making it one of the fastest-growing in the Middle East [41]. This growth opens up a lot of possibilities for recommendation engines, virtual shopping assistants, and personalisation driven by AI. AI can assist shops in providing individualized journeys and fostering brand loyalty as younger consumers want seamless digital experiences [52].

Additionally, immersive technologies like virtual reality (VR) and augmented reality (AR) are becoming more popular in retail marketing. By enabling customers to see things before they

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buy them, these technologies lower uncertainty and increase customer happiness [43]. Businesses who are experimenting with AR and VR will have the chance to combine these technologies with AI analytics, allowing for real-time customization in immersive settings.

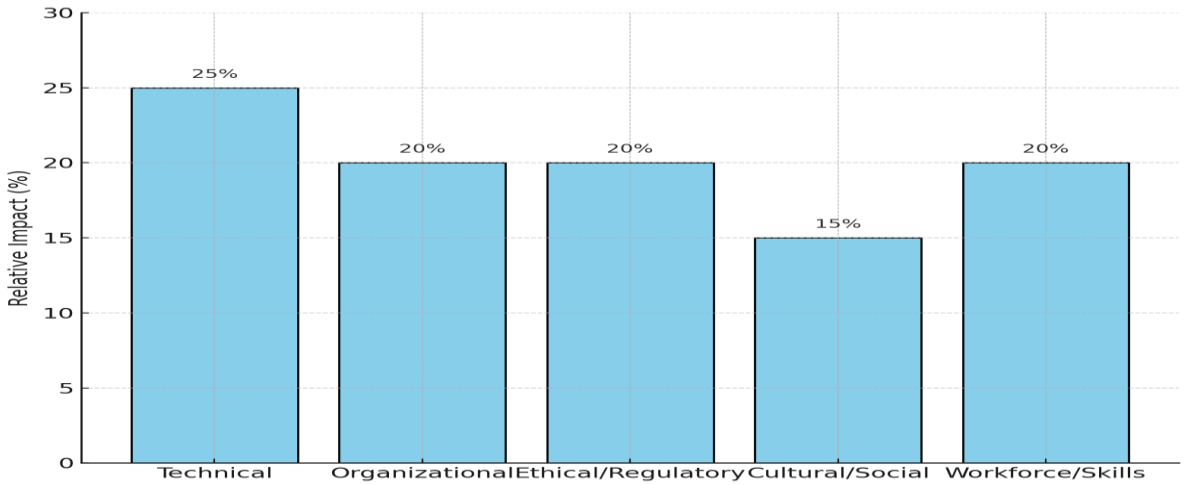

Figure 3. Relative Impact of Challenges on Al Adoption in Marketing

5.2 Tourism Marketing and Smart Destination Management

Saudi Arabia wants to draw 100 million tourists annually by 2030, making tourism a key component of Vision 2030 [53]. Through campaign customization for various traveler demographics, hotel pricing optimisation, and sentiment analysis of Saudi destinations worldwide, artificial intelligence (AI) can improve destination marketing. Travelers can receive multilingual assistance from AI-enabled chatbots, and predictive analytics can predict tourist volumes for major events like the Hajj or Riyadh Season. Tourism authorities may create more targeted advertising by combining data from social media, airlines, and booking platforms. This would help them achieve Vision 2030's objective of making Saudi Arabia a major international travel destination [36].

5.3 Financial Services and Fintech Transformation

The banking industry in the Kingdom is likewise rapidly going digital. Through clear digital interfaces, AI in fintech marketing facilitates fraud detection, personalised investment suggestions, and the development of trust [44]. To improve client interaction, Saudi banks are implementing sentiment-based targeting, chatbots, and predictive analytics. Opportunities for AI-driven marketing efforts to increase customer adoption are presented by the emergence of digital wallets and blockchain-enabled services. These advancements are consistent with the goal of Vision 2030, which is to create a cashless society backed by cutting-edge digital infrastructure [54].

5.4 Healthcare and Wellness Marketing

Another industry with great potential for AI-enabled marketing is healthcare. AI is being used by hospitals and private clinics to create customized wellness programs, advertise preventive care plans, and deploy virtual assistants to monitor patient engagement [45]. By encouraging tailored solutions, AI-driven predictive health marketing in Saudi Arabia can address public health issues like diabetes and obesity. These prospects align with Vision 2030's focus on improving quality of life via innovative and easily accessible healthcare services.

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5.5 Cross-Sector Entrepreneurship and Startups

AI-driven marketing innovation thrives in Saudi Arabia's expanding startup scene. Entrepreneurs are encouraged to use AI into digital platforms via Vision 2030 initiatives like Fintech Saudi and the National Technology Development Program (NTDP). By providing AI-powered solutions that are suited to linguistic and cultural contexts, this gives local companies the chance to compete on a regional level [55].
Saudi Arabia can create robust digital ecosystems by supporting domestic AI solutions and lowering reliance on international technologies. This trend supports national self-reliance in innovation and is consistent with Floridi's [25] appeal to lessen reliance on technology.

5.6 Future Trends

In Saudi Arabia several emerging trends are likely to shape the future of AI-driven marketing:

1. Generative AI in Marketing Content: The use of generative AI (text, image, video) to automate personalized content creation, while maintaining cultural sensitivity, is expected to grow rapidly.
2. Emotion AI and Sentiment Analytics: Tools capable of detecting emotions from facial expressions, speech, and online text will enhance consumer engagement by offering hyper-personalized interactions [56].
3. AI and Sustainability Marketing: As Vision 2030 emphasizes sustainable development, AI can support green marketing campaigns by analyzing consumer preferences for eco-friendly products and services [57].
4. Integration with the Metaverse: The combination of AI with immersive virtual environments will open opportunities for innovative brand experiences and consumer engagement in digital spaces [58].
5. AI-Enabled Policy Feedback Loops: Governments and regulators may increasingly use AI analytics to monitor marketing practices and design policies that enhance consumer trust without stifling innovation.

Table 4. Opportunities and Prospects of AI in Marketing Aligned with Vision 2030

Opportunity Area	AI Application	Vision 2030 Pillar Supported	Expected Impact
E-Commerce & Retail	Recommendation engines, AR/VR, chatbots	Vibrant Society, Thriving Economy	Enhanced personalization, loyalty growth [41], [43], [52]
Tourism	Predictive analytics, multilingual chatbots	Diversified Economy, Global Tourism Hub	Optimized campaigns, improved tourist experience [36], [53]
Financial Services	Predictive modeling, fraud detection, blockchain marketing	Thriving Economy, Digital Infrastructure	Improved trust, adoption of digital finance [44], [54]

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Opportunity Area	AI Application	Vision 2030 Pillar Supported	Expected Impact
Healthcare	Virtual assistants, predictive health marketing	Quality of Life, Innovation	Personalized wellness campaigns, preventive care adoption [45]
Startups & Entrepreneurship	AI-powered platforms, local innovation ecosystems	Innovation, National Self-Reliance	Reduced dependency on foreign tech, growth of SMEs [25], [55]
Emerging Trends	Generative AI, emotion AI, sustainability, metaverse	Future-Ready Society	Cutting-edge marketing innovation [56–58]

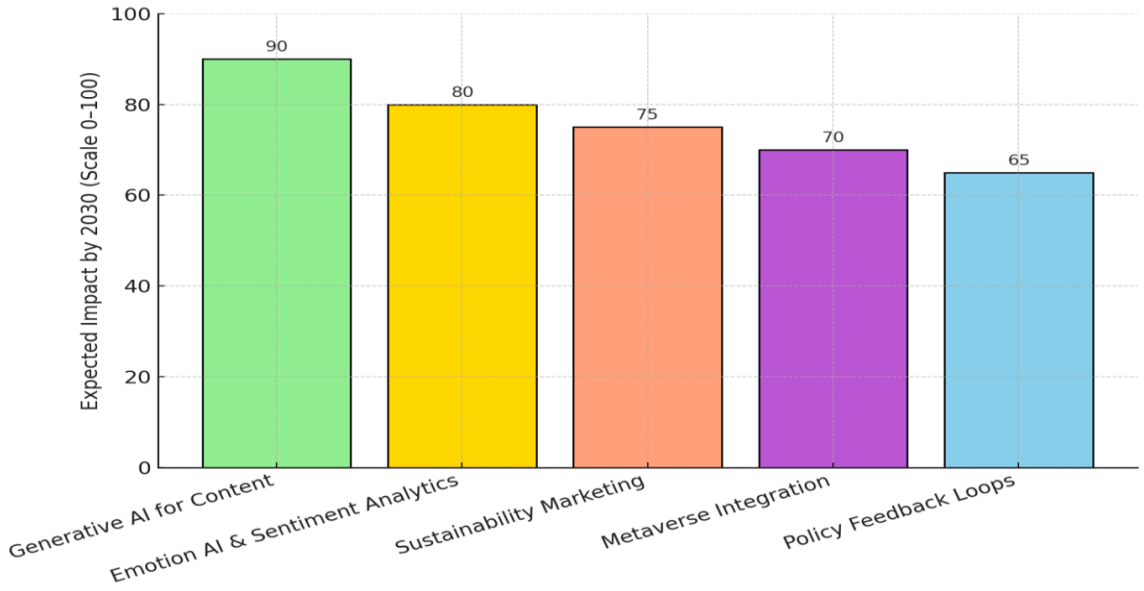

Figure 4. Future AI Marketing Trends in Saudi Arabia (2030 Outlook)

6. Comparative Insights

Understanding Saudi Arabia's progress in AI-driven marketing requires situating it within the broader global context. Countries such as the United States, China, and the United Arab Emirates (UAE) have made significant advances in AI adoption, each with unique strategies that offer valuable lessons for Saudi Arabia. Comparative analysis highlights areas where Saudi Arabia is advancing rapidly, where it lags behind, and how Vision 2030 policies can help close the gap.

6.1 United States: Market-driven Innovation

The United States leads AI marketing adoption primarily through private-sector innovation. Major technology firms Google, Amazon, Meta have pioneered recommendation engines, programmatic advertising, and sentiment analysis tools [59]. AI adoption in marketing is fueled by venture capital investment, a mature digital ecosystem, and deep consumer data availability.

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However, the U.S. faces ongoing debates around privacy regulation. While firms innovate rapidly, fragmented data privacy laws (e.g., California's CCPA vs. federal gaps) create uncertainty [60]. For Saudi Arabia, the U.S. experience demonstrates the potential of market-driven AI innovation but also underscores the risks of weak centralized regulation.

6.2 China: State-led AI Strategy

China's AI development is strongly state-driven, guided by the 2017 "Next Generation AI Development Plan" [21]. In marketing, Chinese firms such as Alibaba and Tencent integrate AI across e-commerce, social commerce, and mobile payments. Personalization and predictive analytics are embedded into super-app ecosystems like We-Chat, where marketing, payments, and consumer engagement converge [61].

China's success illustrates the value of scale, integration, and government support. However, reliance on extensive consumer data has raised ethical questions about surveillance and consumer autonomy [62]. For Saudi Arabia, China's model highlights the potential benefits of strong state involvement but raises caution about balancing innovation with consumer trust.

6.3 United Arab Emirates: Regional Benchmark

The UAE provides a regional benchmark for Saudi Arabia, having launched its National AI Strategy 2031 and appointed the first Minister of State for AI [22]. Dubai and Abu Dhabi have become testbeds for AI-driven retail, tourism, and smart city marketing initiatives. Alshurideh et al. [23] showed how AI adoption in UAE retail and tourism enhanced competitiveness and international branding.

For Saudi Arabia, the UAE experience highlights the benefits of early adoption, regulatory agility, and international collaboration. However, the smaller scale of the UAE means its lessons must be adapted for Saudi Arabia's larger and more complex economy.

6.4 Europe: Ethics-driven Regulation

European countries emphasize ethics and consumer rights in AI adoption. The European Commission's AI Act, currently under discussion, sets out strict guidelines for transparency, accountability, and fairness in AI systems [63]. In marketing, this translates into trust-based adoption, where consumer data is protected under the GDPR framework.

Europe's approach offers lessons for Saudi Arabia in building trust and aligning AI marketing with cultural values. While ethical oversight may slow down rapid commercialization, it ensures long-term consumer acceptance and social legitimacy.

6.5 Saudi Arabia: Progress and Gaps

Saudi Arabia demonstrates rapid adoption of AI in marketing, particularly in e-commerce, retail, and tourism [33], [36], [42]. Vision 2030 provides a clear policy framework, and SDAIA promotes responsible AI use [49]. However, compared with global leaders, Saudi Arabia faces:

- Slower SME adoption relative to large corporations (compared to U.S. and China).
- Regulatory frameworks still evolving, though stronger than the U.S. model but less mature than Europe's.
- Human capital shortages, limiting large-scale deployment compared to China's AI workforce capacity [31].

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Table 5. Cross-country Comparative Insights on AI in Marketing

Country	Policy/Strategy	AI Applications in Marketing	Strengths	Weaknesses / Risks	Relevance to Saudi Arabia
USA	National AI Initiative Act (2020) [20]	Recommendation engines, programmatic advertising, sentiment analysis	Market-driven innovation, VC funding	Weak centralized privacy regulation [60]	Lesson: Encourage private innovation but strengthen consumer trust mechanisms
China	Next Generation AI Development Plan (2017) [21]	Integrated AI in e-commerce & super-apps	Scale, state support, ecosystem integration	Ethical concerns over surveillance [62]	Lesson: Strong state role, but balance with trust
UAE	National AI Strategy 2031 [22]	Retail, tourism, smart city marketing	Early adoption, agile regulation, collaboration	Smaller scale limits generalization	Lesson: Regional benchmark, adaptable policies
Europe	AI Act (proposed), GDPR [63]	Trust-based marketing, regulated personalization	Ethical leadership, strong consumer trust	Slower innovation due to regulation	Lesson: Build trust with strong regulatory frameworks
Saudi Arabia	Vision 2030, SDAIA strategy [49]	E-commerce, retail, tourism, finance	Strong vision, growing ecosystem	SME adoption gap, skills shortage	Leverage lessons from all models while localizing to Saudi context

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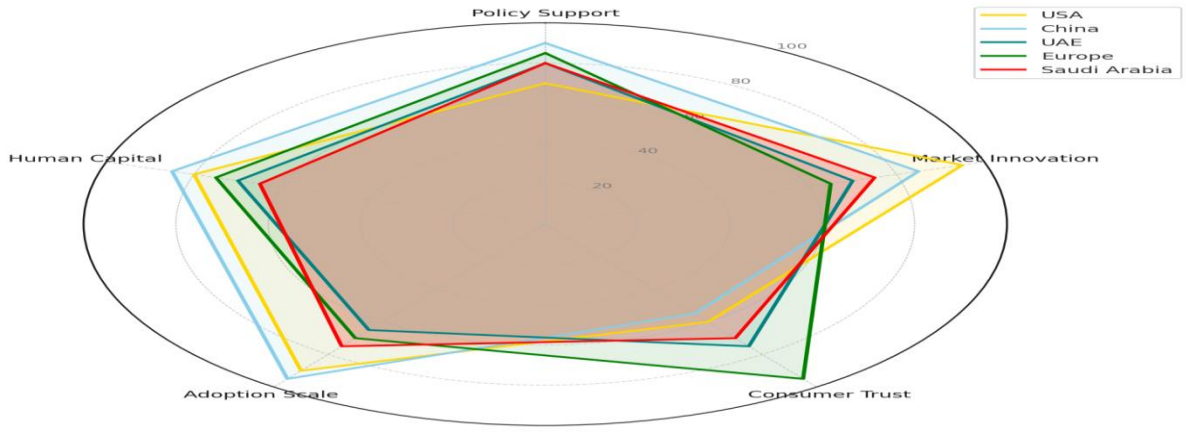

Figure 5. Cross-country Benchmarking of AI in Marketing

7. Conclusion and Recommendations

This review has examined the ambitious role of artificial intelligence (AI) in marketing within the framework of Saudi Vision 2030, highlighting both achievements and areas that require further development. The findings show that Saudi Arabia has established a strong policy foundation, particularly through Vision 2030 and the initiatives of the Saudi Data and AI Authority (SDAIA), which are helping integrate AI into key sectors such as retail, tourism, finance, and healthcare. Already, AI is improving personalization, predictive intelligence, and consumer engagement, signaling that the country is moving in the right direction.

However, significant obstacles still exist. Large-scale adoption is nevertheless hampered by organizational resistance, cultural and ethical issues, a lack of qualified personnel, and limits in technical infrastructure. Saudi Arabia is ambitious and has a solid policy orientation when compared to other leading nations, but in order to fully realize the promise of AI, it needs to step up its efforts in market innovation and human capital development. If these issues are not resolved, adoption might continue to be unequal and concentrated in larger companies, leaving small and medium-sized businesses (SMEs) behind.

Experiencers from around the world offer insightful advice. Although its disjointed approach to privacy protection serves as a warning, the United States is a prime example of the strength of market-driven innovation. China serves as an example of how ecosystem integration and state-led policy can hasten adoption, but its reliance on mass data collecting presents moral dilemmas.

While Europe prioritizes ethics, accountability, and consumer trust through strong regulatory frameworks like the GDPR and the proposed AI Act, the United Arab Emirates offers a useful regional evaluation that proves the advantages of early adoption and flexible regulation. Saudi Arabia falls somewhere in the middle of these models, able to use their best features while escaping their drawbacks by adapting solutions to its unique economic and cultural issues.

The research leads to a number of recommendations. First, the use of AI, currently reserved for large business enterprises, should encompass SMEs. To have the benefits of AI cascade across the economy, incentives, training programs, and regulatory sandboxes should be

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established to reduce barriers to small enterprises. Second, it is important to invest more in human capital. AI training and research must be prioritized for universities, accelerators, and government-industry partnerships if regional innovation ecosystems are to be promoted and foreign technology reliance diminished. Third, customer trust must continue to be a top concern.

Building trust in AI-marketing will require greater ethical requirements and open governance, as informed by Europe's focus on responsibility and rights. Fourth, since AI can be used to directly benefit Vision 2030 goals, it should be encouraged in strategic sectors like retail, healthcare, banking, and tourism. Pilot projects and public-private initiatives can establish best practices and drive broader usage. Fifth, practices that localize in a culturally sensitive and socially responsive way are as vital as continuing cooperation with global leaders in AI, especially around concerns like personalization and data. In order to keep regulations current and informed by evidence, robust monitoring and evaluation systems of high standards must be put in place to assess the ethical, social, and economic consequences of AI marketing.

Overall, Saudi Arabia's advancement under Vision 2030 demonstrates the promise and complexity of AI-driven marketing. The Kingdom is poised to lead the space, but sustained success will hinge on achieving a balance between creativity and accountability, expertise building, and cultural awareness. Saudi Arabia is able to create an efficient and lasting hybrid model through the combination of European ethical regulation, the scale of China, the flexibility of the UAE, and American-style ingenuity, which it then shapes according to the domestic environment. Effective use of AI in marketing will accelerate digitalization in the country and lead to global discourse on the adoption of ethical and human-centered AI.

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Conflict of Interest

Has no conflict of Interest.

Data Availability Statement

This article does not contain any studies with animals performed by any of authors.

Author Contribution Statement

The authors have equally written the proposed model, introduction, the numerical results, the conclusions besides reviewed the data analysis including the statistical errors.

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