



ISSN: 2617-6548

URL: www.ijirss.com



The role of gen AI in enhancing creativity and efficiency in content marketing creation: Scoping review and future insights

Mohammed Mostafa Refaat Moharam^{1,2*},  Ahmad Tawalbeh³

¹Arts and Social Sciences College, Sultan Qaboos University, Muscat, Sultanate Oman.

²Faculty Public Relations and Advertising Department, Cairo University, Cairo, Egypt.

³College of Communication and Media Technologies, Gulf University, Sanad 26489, Kingdom of Bahrain.

Corresponding author: Mohammed Mostafa Refaat Moharam (Email: m.moharam@squ.edu.om)

Abstract

This study examines the role of Generative AI (Gen AI) in digital marketing content creation across various formats, such as text, images, videos, programming, and data analysis. It highlights the creative potential and efficiency of AI-generated content while also addressing the challenges that come with its use in marketing. Insights are drawn from a review of marketing studies conducted between 2021 and 2024. The findings reveal that Gen AI can generate innovative marketing ideas, automate content production, and enhance existing materials. It enables hyper-personalization by analyzing vast amounts of data to tailor content to individual preferences and behaviors. However, the study also points out significant challenges, including contextual understanding, data privacy, ethical concerns, limitations in creativity, over-reliance on AI, and maintaining brand voice consistency. Looking to the future, the research outlines key scenarios, such as improved collaboration between humans and AI, a rise in voice and visual content, the development of dynamic content, and a stronger focus on ethical AI practices. It also suggests that AI-driven insights will significantly influence the future of digital marketing, potentially incorporating mind-reading techniques across devices to enhance user experiences and digital content.

Keywords: Content marketing, Creativity, Digital marketing, Efficiency, Gen AI.

DOI: 10.53894/ijirss.v8i1.5060

Funding: This study received no specific financial support.

History: Received: 19 January 2025 / Revised: 24 February 2025 / Accepted: 28 February 2025 / Published: 3 March 2025

Copyright: © 2025 by the authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Publisher: Innovative Research Publishing

1. Introduction

Artificial intelligence has fundamentally transformed marketing operations, driving significant changes across multiple dimensions. This evolution encompasses everything from marketing research and content creation to managing customer relationships and analyzing marketing data to gauge effectiveness. AI tools have emerged as essential strategic partners in

the marketing landscape, offering a range of capabilities that enhance the design of marketing campaigns and the generation of creative content with increased efficiency and speed. Consequently, hesitating to adopt these technologies or harboring apprehensions about their use may pose substantial challenges for marketers and businesses, compelling them to invest additional resources to achieve comparable outcomes without leveraging these advanced tools.

Generative AI has been progressing swiftly, significantly impacting various industries, with marketing standing out as a key beneficiary of this technological advancement. As competition intensifies in the digital realm, the capacity to generate compelling, original, and pertinent marketing content that aligns with products and highlights their competitive advantages has become essential. This research examines the diverse ways in which generative AI contributes to boosting creativity and efficiency in the creation of marketing content.

Gen AI refers to algorithms that can generate new content, including text, images, videos, animations, and multimedia, based on patterns learned from previous data.

This capability provides powerful tools for marketers, enabling them to automate content creation processes, stimulate innovation, improve the quality and diversity of marketing content, and save time, and financial and human resources [1].

Incorporating Gen AI into marketing can facilitate the rapid creation of personalized content that resonates with the preferences of the target audience. By leveraging data analytics, AI systems can uncover consumer behavior patterns, allowing marketers to customize messages that align with these expectations. This approach not only boosts engagement but also strengthens the connection between brands and consumers.

Gen AI acts as a creative partner for marketing teams, generating a variety of ideas and concepts. This collaborative dynamic enhances the brainstorming process, enabling marketers to think of innovative solutions that would not have emerged through traditional methods. In this way, AI contributes to expanding the horizons of creativity, innovation, and uniqueness in marketing campaigns.

The efficiency offered by Gen AI also enhances its value in a marketing environment that demands speed and delivery, where the process of producing high-quality content quickly and efficiently through AI technologies is a game-changer for marketing. By automating routine tasks, such as drafting social media posts, writing copy, or creating visual ad designs, marketers can direct their efforts toward more effective marketing strategies [2].

The integration of Gen AI into marketing content creation represents a pivotal shift in how businesses engage with their audiences. As brands and businesses increasingly seek innovative ways to capture consumer attention, Gen AI is emerging as a powerful tool capable of producing high-quality content efficiently and at scale. This technology not only simplifies the content creation process but also enhances the creative capabilities of marketing teams [3].

Gen AI encompasses various techniques, including natural language processing and machine learning, to generate text, images, and multimedia content. Its applications in marketing are diverse, ranging from automated social media posts and personalized email campaigns to creating engaging content and ads [4].

By leveraging Gen AI, marketers can analyze massive amounts of data to customize content that resonates with their target audience demographics, thereby improving engagement rates, conversion outcomes, and purchases [5].

Despite the many advantages that Gen AI offers in this regard, its implementation also raises important considerations regarding creativity, ethical implications, and the potential for over-reliance on automated systems. The adoption of Gen AI in marketing faces several challenges. Concerns about the authenticity of machine-generated content remain, as marketers must ensure that content is consistent with the brand's identity and values. This requires a delicate balance between automation and human oversight to ensure the quality of marketing content produced by Gen AI [6].

The ethical implications of using generative AI are significant and should not be ignored. Key concerns include data privacy, content ownership, and the potential for biases in algorithms. As AI adoption grows, it is crucial to develop ethical guidelines to uphold consumer trust and ensure the integrity of the marketing industry as a whole [7].

Based on the above, the research aims to conduct a secondary analysis of previous research and studies that discuss the role of Gen AI in enhancing creativity and efficiency in the digital marketing content industry, while monitoring the most important trends and modern research issues that define this role, as well as tracking the challenges mentioned by research regarding the use of Gen AI in the production of marketing content, especially ethical, professional, and creative challenges. The study also explores future paths for the use of Gen AI technologies in marketing and content production.

2. Methodology and Sampling

This study is categorized as descriptive research using the Qualitative Scoping Review method. It systematically reviews existing literature on a topic, pinpointing key concepts, gaps, and types of evidence, while also synthesizing qualitative studies to uncover themes, concepts, and subjective experiences related to a specific phenomenon [8]. This research approach leverages data from previous studies by collecting, classifying, and analyzing them to derive precise insights and knowledge. The findings are summarized and compared to highlight how earlier research has addressed the topic in question.

One of the main advantages of the literature review is that it allows insights and conclusions to be drawn without the need to collect new data or conduct empirical studies or practical experiments, which saves time and research effort [9]. Conducting this type of research requires carefully selecting sources and ensuring the reliability of the data and its relevance to the research objectives. It also requires adopting a critical, analytical, and comparative approach in presenting the results of data analysis from previous studies [10].

One of the main advantages of the Qualitative Scoping Review method is the ability to obtain insights and draw conclusions without the need to collect new data or conduct empirical studies or practical experiments, which saves time and research effort [11]. Conducting this type of research requires carefully selecting sources and ensuring the reliability of the

data and its relevance to the research objectives. It also requires adopting a critical, analytical and comparative approach in presenting the results of data analysis from previous studies [12].

To investigate prior research focused on the application of Gen AI techniques to improve creativity and efficiency in the marketing content industry, the researcher employed a survey method. This involved analyzing a sample of 93 scientific studies related to the use of Gen AI in marketing content, collected from January 2020 to December 2024.

A purposive sample of 90 studies was selected ensuring diversity of studies and research schools and reflecting the prevailing trends and topics in this field. The researcher used many databases and academic websites to obtain studies such as: Google Scholar - Emerald insight - Web of Science - JSTOR - EBSCO - Research gate- ProQuest - SAGE- Springer - academia- DOAJ- Social Science Research Network - ScienceDirect.

Inclusion Criteria:

- Studies that include "AI" and/or "Marketing" in the title.
- Studies were published from January 2021 to December 2024.
- Only articles published in journals and scholarly publications.
- Only articles written in English.

Exclusion Criteria:

- Studies that don't match the keywords.
- Duplicate studies found using their digital object identifier (DOI).
- Publications not in English.
- Dissertations and conference papers.

Research contribution by geographical area:

- American research: 35.5% of studies.
- European research: 29% of studies.
- Asian research: 22.5% of studies.
- Middle Eastern research: 13% of studies.

Table 1.

Scientific schools of research.

Geographical area	Frequency	%
American research	30	33.3
European research	27	30
Asian research	21	23.3
Middle Eastern research	12	13.3
Total	90	100

The majority of studies employed quantitative methods for data collection. Specifically, consumer surveys comprised 26.6% of the research, while surveys examining marketing practices across different sectors accounted for 22.2%. Content analysis of marketing materials represented 14.4%, qualitative methods made up 12.2%, and case studies constituted 10%. Studies that combined both quantitative and qualitative approaches accounted for 7.7%, and secondary analysis of existing research represented 6.6%.

Table 2.

Research methodologies.

Method	Frequency	%
Consumer survey	24	26.6
Survey of marketing practices	20	22.2
Secondary analysis	6	6.6
Content analysis of marketing materials	13	14.4
Case study	9	10
Qualitative method	11	12.2
Combination of quantitative and qualitative	7	7.7
Total	90	100

The theoretical frameworks and scientific models utilized in previous studies showed considerable variation. Notably, 71% of the analyzed studies did not adhere to any specific theoretical frameworks or scientific models, while only 29% were based on such frameworks. Among the most significant frameworks and models identified were the Technology Acceptance Model, the AI Job Replacement Model, the Theory of Diffusion of Innovations, the Theory of Technological Determinism, the Theory of Media Convergence, the Omni-Channel Marketing Model, the Data-Driven Marketing Model, the Task-Technology Fit Model, the Unified Theory of Acceptance and Use of Technology (UTAUT), the Engagement Pyramid Model, and Media Richness Theory. Additionally, some studies employed models developed by the researchers themselves.

The study addresses 4 main questions as follows:

1. What is the impact of Gen AI technologies on creativity in the marketing content industry?

2. How do these technologies contribute to improving the efficiency of marketing campaign content and measuring its impact?
3. What are the challenges of employing Gen AI in producing marketing content?
4. What are the future paths for employing AI in producing marketing content?

3. Results

The results of the study are presented in light of answering its questions as follows:

Q1: What is the impact of Gen AI technologies on creativity in the marketing content industry?

Gen AI can produce various types of marketing content, including texts, images, and videos, which may reduce human effort in the process of thinking, creating, and implementing various digital marketing media.

1-1- Creativity and production of text marketing content:

AI could create attractive marketing blog content based on the keywords and topics provided, which contributes to improving search engine results for the brand and finding it easily in the first results of search engines [13].

Gen AI can formulate concise and engaging posts designed for different social media platforms, in line with the nature and characteristics of each platform. Gen AI has also contributed to producing email campaign content and personalizing email content by analyzing recipient data such as demographic characteristics, interaction behavior with messages, and their preferences, which facilitates the process of customizing message content to suit their interests [14].

Natural Language Processing (NLP) technology has enabled marketers to produce text content that carefully reflects product descriptions with keywords and a unique description, especially with e-commerce products, ensuring search engine optimization and improving conversion rate [15].

1-2- Creativity and production of visual marketing content:

Customizing graphics and images is easy and simple with Gen AI. Tools like DALL-E, Midjourney, and Pika can generate unique images based on text input, allowing marketers to develop images that perfectly align with their brand and marketing messages [16].

AI can generate multiple variations of static ad designs, enabling A/B testing to determine which designs resonate best with target audiences [17]. Gen AI can help design brand's visual identity with its various components such as logos, graphics, fonts, colors, charts, profile picture designs, and cover images across social media platforms. Simplifying the design process and maintaining the consistency of the brand's visual identity [18].

1-3- Creativity and production of marketing videos:

There are many AI tools that collect footage, images, and texts available on the Internet to create promotional videos, which greatly reduces time and costs [19].

Some Gen AI tools write the script and formulate texts for video content, ensuring that messages are clear and consistent with marketing goals and the voice and identity of the brand [20].

One of the vital uses of AI in creating marketing content is personalized messages via videos, where personalized video content can be created to engage customers and increase interaction with the content, such as personalized promotional messages based on user behavior, preferences, or demographic characteristics [21].

1-4- Generating brand websites:

Gen AI has the ability to program websites and create their designs in a customized manner that is consistent with the brand identity, as it can develop an attractive user interface that reflects the brand's personality with colors, designs, and fonts that are consistent with it [22].

1-5- Generating marketing ideas:

AI tools can generate creative ideas for digital marketing campaigns, generating slogans, or digital content topics. This can help marketers overcome creative hurdles and explore a wider range of ideas [23].

While AI can generate creative ideas, human supervision is crucial to adding emotional depth, brand voice, and context that AI may lack. Marketers can use AI-generated drafts as a basis for improving content and generating ideas, but with the human mind at the core of the creative process and writing marketing text. Feedback from chatbots is not as important to the target audience as feedback from humans and direct conversations with customer service representatives [24].

1-6- Data-driven creativity:

AI has the ability to analyze huge amounts of data about consumer behavior and preferences, and then extract creative decisions and help design content to suit the tastes of the target audience [25].

Also, AI language models can help adapt marketing content to different cultures and languages, and maintain brand consistency while taking into account cultural differences [26].

1-7- Employing augmented reality in marketing content:

Augmented reality provides creative and immersive experiences that attract consumers in innovative ways [27]. There are several methods for employing augmented reality in marketing content, such as interactive product demonstrations, which allow customers to see and interact with products in their real environment before making a purchase [28]. For example, IKEA uses augmented reality to allow customers to see what a piece of furniture will look like in their homes, enhancing the shopping experience.

Another method is storytelling through augmented reality, where augmented reality adds vitality and interactivity to the narrative by allowing users to open specific marketing content or immersive product experiences [29, 30]. Augmented reality experiences have also allowed customers to virtually try on clothes, accessories, or makeup using their mobile devices. Cosmetics brands such as L'Oréal have successfully implemented creative marketing experiences through augmented reality that allow users to see how products look on their skin, effectively enhancing the shopping experience [31].

1-8- Using virtual reality in marketing content:

One of the most important advantages of virtual reality is its ability to transport users to entirely new environments, allowing them to interact with products or marketing narratives in a way that traditional media cannot. Brands can create virtual showrooms where customers can explore products in a three-dimensional space, enhancing their understanding and emotional connection to the brand [32].

Gamification through virtual reality can also help create creative marketing content through virtual games, to immerse the consumer in the marketing experience. An example of this is the “Drive the Future” game by Audi, which relies on a virtual driving experience of virtual Audi cars and interacting with their features, which increases awareness of the car’s capabilities and features [33].

Q2: How do these technologies contribute to improving the efficiency of marketing campaign content and measuring its impact?

According to the survey of previous studies, the researcher was able to answer the question according to several axes as follows:

2-1- Using AI in analyzing big data, personalizing messages, and predicting consumer behavior:

AI works to benefit from big data to enhance the efficiency of companies' marketing strategies. By analyzing huge amounts of data, AI can reveal patterns and insights that marketers may unintentionally ignore [34]. Therefore, the process of analyzing big data with AI provides several advantages for businesses, including segmenting their audiences more accurately, and personalizing messages and offers to specific groups based on their marketing behaviors and preferences. Consequently, marketing campaigns become more targeted, leading to higher conversion rates and improved return on investment [35].

To increase marketing efficiency, AI allows improving customer experiences by providing them with accurate personalized recommendations by analyzing user interactions with marketing content and exposure preferences [36].

AI algorithms can suggest products or content that align with individual needs based on search, browsing, and content interaction preferences, creating a more engaging and efficient experience. E-commerce platforms such as Amazon and Alibaba use AI-powered recommendation engines to suggest items based on previous purchases and browsing history, greatly enhancing the likelihood of a consumer purchasing digitally [37].

By leveraging machine learning algorithms, AI can process past data, such as past purchases, demographic data, and consumers' browsing and scanning habits, to develop models that predict future consumer actions. This predictive capability allows businesses to understand which products or services their customers are likely to prefer, enabling them to tailor their marketing strategies [38, 39].

AI's predictive capabilities extend to understanding the customer journey as well. By analyzing data from multiple touchpoints, such as website visits, email interactions, and social media engagement, AI can map out the paths consumers take before, during, and after a purchase [40].

Also, AI-driven forecasting can optimize inventory management by accurately predicting product demand, which helps minimize the chances of overstocking or running out of stock [41].

It also improves customer segmentation, enabling businesses to create more personalized marketing strategies that cater to individual preferences and behaviors. This approach allows companies to outpace their competitors and respond proactively to shifts in the market [42].

2-2- Marketing content automation and Chatbots technology:

AI can automate various marketing processes, simplify marketing operations and thus save time and effort for all parties, whether the consumer or the marketer. AI systems can handle tasks such as collecting and analyzing data and even creating automatic content, allowing marketers to focus on other tasks and save their time and effort efficiently [43].

At the level of marketing email automation, AI technologies can generate emails that suit different situations, such as welcome messages upon subscribing to a service or thank-you messages upon purchasing a product, or even confirmation messages to verify the user's identity, or follow-up messages for registration and purchase, or even promotional messages, or personalized messages related to managing good relationships with customers [44].

Chatbots powered by AI can manage customer inquiries and respond to them immediately with customized and intelligent responses without the need for expensive human resources. AI-powered chatbots provide 24/7 customer support. This round-the-clock availability allows customers to receive instant answers to their queries at any time, reducing frustration and enhancing the customer experience. This sustained access can lead to higher conversion rates as potential customers get the information they need without delay or postponement [43].

Chatbots can provide personalized content recommendations, product suggestions, or relevant blog articles, making interactions more convenient and satisfying for consumers. A study adds that by engaging visitors on a company's website, chatbots can ask specific questions as surveys to identify the visitor's interests and needs, effectively collect contact information, and segment potential customers into targeted segments, achieving broad-based nurturing of potential customers early in their buying journey [39].

An additional benefit of chatbots is that they instantly provide hyperlinks to relevant content on the topic that the consumer needs, which leads to increased traffic to the company's website, and keeps users engaged and engaged on the site continuously. Chatbots can be effectively used to advertise and manage promotions, such as discounts or special offers. By proactively engaging users with timely messages about new promotions and various announcements [45].

2-3- Sentiment Analysis:

Sentiment analysis is a branch of Natural Language Processing (NLP) that focuses on identifying the emotional tone behind the words a customer writes on any opinion-expression platform such as social media. By using algorithms to analyze

text data, companies can classify sentiment as positive, negative, or neutral. This analysis helps in understanding public perception and can provide insights into customer satisfaction, brand reputation, and prevailing customer trends [46] .

By examining social media interactions, reviews, customer reactions, and comments on social media, AI can measure public sentiment towards a particular brand or product, which helps companies identify emerging trends and consumer preferences, measure product reputation, and know positive and negative reactions about the product, allowing companies to adjust their offerings, improve their reputation, and develop their marketing messages in line with customer sentiment [47-49].

AI-powered sentiment analysis enables companies to make accurate, data-informed decisions. Companies can monitor customer feedback in real-time, allowing for quick responses to negative sentiments, potentially mitigating potential PR crises. Additionally, sentiment analysis can aid product development by highlighting features that customers love or hate, guiding companies in improving their promotions [44].

AI can enhance targeted marketing campaigns by segmenting audiences based on sentiment analysis. By understanding how different consumer segments feel about a brand, marketers can tailor their messaging and promotions to engage more effectively with each group [50].

2-4- Search Engine Optimization (SEO):

Gen AI plays a role in improving search engines by producing high-quality content based on understanding user intent, such as creating articles, blog posts, and product descriptions that match keywords and search queries, thus improving the website's visibility in search engine results [51-53].

AI tools allow you to identify keywords and popular phrases related to a specific industry or specialty, allowing marketers to strategically integrate these keywords into their content, improving their chances of ranking higher in search results. In the same context, a study confirms that Gen AI can analyze competitors' content to uncover gaps and opportunities in keywords, enabling companies to create unique and valuable content that stands out in a crowded digital landscape [50].

2-5- Content curation:

AI can help organize existing marketing content, schedule campaigns, and streamline the process of automatically broadcasting content once it is programmed, as well as suggest updates or reuse previous marketing materials in different forms to maintain content diversity and sustainability [54-56].

Efficiently measuring marketing impact and evaluating marketing campaigns: AI plays an effective role in the continuous evaluation of marketing campaigns, as AI-powered analytics allow marketers to monitor campaign performance during its launch by analyzing key performance indicators (KPIs) such as click-through rates, engagement levels, and conversion rates. AI can also provide actionable insights into successful and unsuccessful methods or methods that need further development. This flexibility allows marketers to make informed decisions and improve campaign performance to achieve better results without waiting for post-campaign analysis [19, 26, 57].

2-6- Artificial Intelligence User Interface (AIUI) in the context of Customer Relationship Management (CRM):

AIUI plays an important role in (CRM) by supporting the efficiency of content produced by businesses to manage customer service more interactively with their target audience [58].

By integrating AI technologies into user interfaces, AIUI streamlines processes, automates tasks, personalizes customer interactions more effectively, and responds to their needs quickly and efficiently. AIUI also facilitates improved customer service through chatbots, answering common inquiries, and freeing up the effort of human agents to address more complex issues [21].

Q3: What are the challenges of employing Gen AI in marketing content?

Many studies have discussed the most important technical and ethical challenges that companies need to deal with carefully in this regard, including:

3-1- Content quality and relevance:

There are challenges associated with the quality of marketing content produced by AI, as general content or content outside the scope and identity of the brand can be generated, in other words, content that lacks the depth and nuances required for effective marketing content [59]. Therefore, marketers should implement strict review processes to ensure that the content generated by AI is in line with their strategic goals and the identity and voice of the brand [6].

Over-reliance on Gen AI tools may lead to content saturation in the digital environment, as the market may be flooded with similar types of content, making it difficult for brands to find unique characteristics or a distinctive tone for them, and this saturation can weaken the effectiveness of marketing campaigns and reduce audience engagement [19].

3-2- Ethical considerations:

There are ethical challenges associated with employing AI in generating marketing content, as issues related to copyright infringement arise when AI generates content that is very similar to works already on the Internet, resulting in legal challenges and damage to the brand's reputation, and may lead to legal accountability from competing brands [60].

One of the most prominent ethical concerns is the potential for copyright and intellectual property infringement, as Gen AI models are trained on huge data sets that often include copyrighted material, so AI may produce content that is very similar to works protected by copyright and intellectual property [61]. Therefore, the two studies recommend the importance of exercising caution to ensure that the content produced does not violate copyright and intellectual property laws, which may lead to legal consequences and negative consequences for the brand's reputation [62].

One of the ethical challenges in this regard is that consumers may not be aware and conscious while interacting with AI-generated content, which may lead to negative feelings tainted by deception and marketing misleading, and thus ethical marketing practices require brands to disclose the use of AI in content creation, and enhance trust and authenticity [63].

One of the ethical concerns is the impact that Gen AI raises on human creativity and the professional employment of human resources. As AI systems become more capable of producing high-quality content, there are growing concerns that the value of human creativity will be undermined, and that the automation of content production could displace jobs for copywriters, designers, and other creative professionals [64]. Therefore, the collection and use of personal data must comply with regulations such as GDPR and CCPA to protect consumer rights, as the possibility of data misuse or hacking can erode consumer trust in the brand, which increases the importance of companies and brands' commitment to managing consumer data with privacy and security and ensuring that informed consent is obtained from consumers regarding email marketing campaigns or any promotional messages generated by AI via smartphones [65].

3-4- Training human resources on AI technologies:

There is an urgent need for continuous training of employees in marketing and public relations departments to work alongside AI tools and acquire skills to use AI technologies optimally, in addition to setting clear guidelines on how to effectively benefit from AI outputs in marketing campaigns [66-69].

Q4: What are the future paths for employing AI in producing marketing content?

Many future studies have monitored scenarios and expectations regarding the future of the marketing industry in general and digital marketing in particular in depth in light of the AI revolution. The following is a summary of the future expectations reached by studies in this regard:

4-1- Marketers will benefit from advanced big data analytics to create highly personalized marketing experiences known as hyper-personalization, resulting in marketing messages that match individual preferences to the deepest extent. Predictive analytics will enhance the decision-making process for advertisers and marketers, enabling brands to quickly anticipate consumer behavior and improve the performance of marketing campaigns in time [70].

4-2- Marketers will attach great importance to the field of programming and the use of the Python language in programming various marketing operations, as this language is considered high-level, easy to read and learn, and is usually used in many applications, including developing modern websites, analyzing big data, machine learning, and automating marketing tasks [71].

4-3- Smartphones will become the most important means in digital marketing in terms of producing marketing content and completing various marketing tasks related to marketing analysis, tracking marketing campaigns, and measuring their performance [72]. Virtual assistants such as Alexa and Google will have extensive marketing uses at the level of producing and organizing marketing content, and at the level of big marketing data analysis [69].

4-4- The use of voice and visual search rates will increase through AI tools equipped with these features in the field of digital marketing in order to verify the authenticity of marketing content and its lack of similarity to other content. [73].

4-5- The scope of using augmented and virtual reality together in marketing activities will expand with the aim of enhancing immersive experiences for customers, especially in shopping sites and online stores, and extended reality will have a significant presence in this regard [74].

4-6- Marketing forecasting will be employed through programmatic advertising by predicting market trends and future customer behavior, as historical data will be analyzed and advanced predictive models will be used through AI [75]. Marketers can then use this information to guide digital advertising strategies, improve demand forecasts, inventory planning, and increase the efficiency of advertising reach [76].

4-7- The use of UI interfaces based on audio and visual AI will spread widely, which will adapt to user preferences and ease and speed of access to the required products [77].

4-8- The use of AI-based dynamic pricing models that adjust prices in real time based on various factors such as supply and demand fluctuations, competitor prices, and customer purchasing behavior will increase, ensuring that market conditions are taken into account and achieving a competitive advantage based on variable pricing [78].

4-9- AI technologies will also be employed in efficient crisis management, opportunity discovery, and loss mitigation, as AI helps monitor and analyze media, identify potential crises and opportunities, and then enable companies to respond proactively and strategically [79].

4-10- AI will enhance multi-channel marketing strategies by providing marketing insights that are tailored to the nature of each channel or platform, allowing for a unique and integrated customer experience across different marketing channels. [80].

4-11- The levels of automation of routine marketing tasks will increase as AI systems will take over many routine marketing tasks such as managing PPC advertising campaigns and analyzing data, allowing marketers to focus on creative and persuasive strategies [81].

4-12- Mind reading technology is anticipated to boost the field of neuromarketing through the use of brainwave measurement and wearable EEG (electroencephalography) devices. These devices, which could be incorporated into headphones or other accessories, would measure consumers' brainwave activity in response to mobile advertisements or marketing content [82].

Facial coding is another innovative approach, utilizing mobile phone cameras along with AI-driven facial recognition software to analyze subtle facial expressions. This can help assess emotional reactions to marketing stimuli [83].

Also, physiological sensors in smartphones and smartwatches can monitor metrics such as heart rate and skin conductance. This data can offer insights into consumers' emotional states as they engage with marketing materials [84].

The applications of mind reading technology extend to various marketing areas, including ad testing, customizing website content and mobile app interfaces to resonate more deeply with users, product development, and enhancing customer experiences by predicting their needs [85].

4. Discussion

Impact of Gen AI on Creativity: Gen AI significantly impacts marketing content creation by producing diverse content such as text, images, and videos. It aids in creating blog content for search engine optimization, social media posts, personalized email campaigns, and unique product descriptions. Gen AI tools like DALL-E and Midjourney facilitate the creation of customized graphics and images. It can also design visual brand identities, including logos and social media visuals. Moreover, Gen AI can create promotional videos using online resources, write video scripts, and personalize video messages. It can also program and design websites, generate marketing campaign ideas, slogans, and content topics. Furthermore, AI can analyze consumer data to create tailored content and adapt marketing to different cultures. Augmented reality (AR) and virtual reality (VR) are also enhanced through Gen AI, offering immersive customer experiences.

Efficiency and Measurement: Gen AI improves marketing efficiency by analyzing big data to understand consumer behavior and preferences. It personalizes messages, provides product recommendations, and predicts consumer actions. AI also helps in optimizing inventory management and customer segmentation. Marketing content automation and chatbots save time and effort by managing customer inquiries and providing 24/7 support. Sentiment analysis using AI identifies the emotional tone of customer feedback, helping companies understand public perception and improve their offerings. Additionally, AI enhances search engine optimization (SEO) by creating high-quality content with relevant keywords. It also aids in content curation by organizing and scheduling campaigns. AI-powered analytics monitor campaign performance, enabling real-time adjustments. Furthermore, AI user interfaces (AIUI) improve customer relationship management (CRM) by streamlining processes and personalizing interactions.

Challenges of Employing Gen AI: The use of AI in marketing content presents challenges, including maintaining content quality and relevance, and avoiding content saturation in the digital environment. Ethical concerns include copyright and intellectual property infringement, the potential for consumer deception, and the impact on human creativity and employment. Data privacy is another concern, requiring compliance with regulations like GDPR. Additionally, human resources need training to work effectively with AI tools.

Future Paths for AI: The future of AI in marketing includes hyper-personalization through advanced data analytics and greater importance for programming skills, especially in Python. Smartphones will play a central role in digital marketing, along with virtual assistants. Increased use of voice and visual search through AI is expected, as is the expansion of augmented and virtual reality for immersive experiences. Marketing forecasting will be enhanced through programmatic advertising. AI-based dynamic pricing models will become more common. AI will also improve crisis management and multi-channel marketing. Moreover, AI will increase the automation of routine tasks. Finally, mind-reading technology will be used to measure emotional responses to marketing content.

This research highlights how AI is fundamentally changing how marketing content is made, how efficiently it's produced, and how its impact is measured. While there are definitely some hurdles to overcome, the possibilities for future progress are significant. This study underscores the necessity for continued investigation into the ethical considerations, technological improvements, and overall effects of AI within the marketing field. It provides a thorough look at both where AI currently stands in marketing and where it's headed.

5. Recommendations

Among the most important recommendations of this study - inspired by its results - are the following:

1. The importance of marketers and advertisers using Gen AI tools in the digital content industry is evident due to their positive effects on enhancing creativity, providing diverse content options, and simplifying the advertising production process.
2. Investing in training programs for marketing professionals to use Gen AI tools effectively.
3. The need to develop a clear ethical guidelines document for marketing and public relations professionals is essential to clarify the ethics of employing Gen AI in marketing operations. This includes transparency about the content generated by AI, ensuring its compatibility with brand values, avoiding misleading information, maintaining the privacy of customer data, and emphasizing the importance of integrating AI with human creativity instead of replacing it.
4. Giving research importance at the Arab region level to research on employing AI in marketing and public relations, especially in light of the emergence of new technologies such as mind-reading technology through AI.
5. Giving research importance to the use of blockchain technologies in digital marketing operations increases the procedural efficiency of transactions, such as concluding smart contracts between companies and marketing agencies, and making open data available to facilitate the marketing decision-making process.
6. The urgent need to educate and train those responsible for digital marketing communications to engineer prompts in Gen AI includes designing and developing commands and instructions that direct AI models to create new content, such as text, images, or audio.
7. The importance of encouraging cooperation between the academic and industrial sectors in countries to exchange knowledge and expertise leads to the development of innovative solutions based on sovereign AI, which enhances the effectiveness of the marketing content industry at the international level. This ensures that each country has its own marketing footprint by developing its capabilities to produce AI tailored to its needs using its own workforce, infrastructure, and network.

References

- [1] S. Samoli, M. L. Cobo, E. Gómez, G. De Prato, F. Martínez-Plumed, and B. Delipetrev, "AI watch defining artificial intelligence towards an operational definition and taxonomy of artificial intelligence," *JRC Research Reports*, p. 118163, 2020. <https://doi.org/10.2760/382730>
- [2] M. M. Mariani, R. Perez-Vega, and J. Wirtz, "AI in marketing, consumer research and psychology: A systematic literature review and research agenda," *Psychology Marketing*, vol. 39, no. 4, pp. 755-776, 2022. <https://doi.org/10.1002/mar.21619>
- [3] N. Kshetri, Y. K. Dwivedi, T. H. Davenport, and N. Panteli, "Generative artificial intelligence in marketing: Applications, opportunities, challenges, and research agenda," *International Journal of Information Management*, vol. 75, p. 102716, 2024. <https://doi.org/10.1016/j.ijinfomgt.2023.102716>
- [4] R. Deveau, S. J. Griffin, and S. Reis, "AI-powered marketing and sales reach new heights with generative AI," Retrieved: <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/aipowered-marketing-and-sales-reach-new-heights-with-generativeai>. [Accessed 2023].
- [5] R. Gupta, K. Nair, M. Mishra, B. Ibrahim, and S. Bhardwaj, "Adoption and impacts of generative artificial intelligence: Theoretical underpinnings and research agenda," *International Journal of Information Management Data Insights*, vol. 4, no. 1, p. 100232, 2024. <https://doi.org/10.1016/j.ijime.2023.100232>
- [6] E. Hermann, "Leveraging artificial intelligence in marketing for social good—An ethical perspective," *Journal of Business Ethics*, vol. 179, no. 1, pp. 43-61, 2022. <https://doi.org/10.1007/s10551-021-04843-y>
- [7] M. Shaik, "Impact of artificial intelligence on marketing," *East Asian Journal of Multidisciplinary Research*, vol. 2, no. 3, pp. 993-1004, 2023. <https://doi.org/10.55927/eajmr.v2i3.3112>
- [8] A. C. Tricco *et al.*, "A scoping review on the conduct and reporting of scoping reviews," *BMC Medical Research Methodology*, vol. 16, pp. 1-10, 2016. <https://doi.org/10.1186/s12874-016-0116-4>
- [9] S. Kraus *et al.*, "Literature reviews as independent studies: Guidelines for academic practice," *Review of Managerial Science*, vol. 16, no. 8, pp. 2577-2595, 2022. <https://doi.org/10.1007/s11846-022-00588-8>
- [10] M. K. Linnenluecke, M. Marrone, and A. K. Singh, "Conducting systematic literature reviews and bibliometric analyses," *Australian Journal of Management*, vol. 45, no. 2, pp. 175-194, 2020. <https://doi.org/10.1177/0312896219877678>
- [11] Z. Munn, M. D. Peters, C. Stern, C. Tufanaru, A. McArthur, and E. Aromataris, "Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach," *BMC Medical Research Methodology*, vol. 18, no. 1, pp. 1-7, 2018. <https://doi.org/10.1186/s12874-018-0611-x>
- [12] K. Kvarnström, A. Westerholm, M. Airaksinen, and H. Liira, "Factors contributing to medication adherence in patients with a chronic condition: A scoping review of qualitative research," *Pharmaceutics*, vol. 13, no. 7, p. 1100, 2021. <https://doi.org/10.3390/pharmaceutics13071100>
- [13] A. M. Elkhataf, K. Elsaid, and S. Almeer, "Evaluating the efficacy of AI content detection tools in differentiating between human and AI-generated text," *International Journal of Future Engineering and Management Research*, vol. 19, no. 1, p. 17, 2023. <https://doi.org/10.3772/IJFEIR.2023.1917>
- [14] A. Haleem, M. Javaid, M. A. Qadri, R. P. Singh, and R. Suman, "Artificial intelligence (AI) applications for marketing: A literature-based study," *International Journal of Information and Network Security*, vol. 3, pp. 119-132, 2022. <https://doi.org/10.11591/ijins.v3i2.466404>
- [15] M. Lemos, P. J. Cardoso, and J. Rodrigues, "Harnessing AI and NLP tools for innovating brand name generation and evaluation: A comprehensive review," *Multimodal Technologies Interaction*, vol. 8, no. 7, p. 56, 2024. <https://doi.org/10.3390/mti8070056>
- [16] Y. Archana Balkrishna, "An analysis on the use of image design with generative ai technologies," *International Journal of Trend in Scientific Research Development*, vol. 8, no. 1, pp. 596-599, 2024. <https://doi.org/10.21275/sr24509232318>
- [17] X. Zhao *et al.*, "Dear: Deep reinforcement learning for online advertising impression in recommender systems," in *Proceedings of the AAAI Conference on Artificial Intelligence*, 2021, vol. 35, no. 1, pp. 750-758.
- [18] T. M. Nguyen, S. Quach, and P. Thaichon, "The effect of AI quality on customer experience and brand relationship," *Journal of Consumer Behaviour*, vol. 21, no. 3, pp. 481-493, 2022. <https://doi.org/10.1002/cb.1974>
- [19] P. K. Kopalle, M. Gangwar, A. Kaplan, D. Ramachandran, W. Reinartz, and A. Rindfleisch, "Examining artificial intelligence (AI) technologies in marketing via a global lens: Current trends and future research opportunities," *International Journal of Research in Marketing*, vol. 39, no. 2, pp. 522-540, 2022. <https://doi.org/10.1016/j.ijresmar.2021.11.002>
- [20] R. Wahid, J. Mero, and P. Ritala, "Written by ChatGPT, illustrated by Midjourney: Generative AI for content marketing," *Asia Pacific Journal of Marketing Logistics*, vol. 35, no. 8, pp. 1813-1822, 2023. <https://doi.org/10.1108/apjml-10-2023-994>
- [21] S. G. Reddy, A. K. R. Sadhu, M. Muravev, D. Brazhenko, and M. Parfenov, "Harnessing the power of generative artificial intelligence for dynamic content personalization in customer relationship management systems: A data-driven framework for optimizing customer engagement and experience," *Journal of AI-Assisted Scientific Discovery*, vol. 3, no. 2, pp. 379-395, 2023.
- [22] R. Louie, A. Coenen, C. Z. Huang, M. Terry, and C. J. Cai, "Novice-AI music co-creation via AI-steering tools for deep generative models," in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 2020, pp. 1-13.
- [23] F. Magni, J. Park, and M. M. Chao, "Humans as creativity gatekeepers: Are we biased against AI creativity?," *Journal of Business Psychology*, vol. 39, no. 3, pp. 643-656, 2024. <https://doi.org/10.1007/s10869-023-09910-x>
- [24] B. Shneiderman, "Human-centered artificial intelligence: Three fresh ideas," *Transactions on Human-Computer Interaction*, vol. 12, no. 3, pp. 109-124, 2020. <https://doi.org/10.1177/0511770511thci.00119>
- [25] Z. Cui, X. Jing, P. Zhao, W. Zhang, and J. Chen, "A new subspace clustering strategy for AI-based data analysis in IoT system," *International Journal of Technology*, vol. 8, no. 16, pp. 12540-12549, 2021. <https://doi.org/10.1007/s40940-021-00207-0>
- [26] M. Stone *et al.*, "Artificial intelligence (AI) in strategic marketing decision-making: A research agenda," *The Bottom Line*, vol. 33, no. 2, pp. 183-200, 2020. <https://doi.org/10.1108/BL-03-2020-0040>
- [27] M. Chylinski, J. Heller, T. Hilken, D. I. Keeling, D. Mahr, and K. de Ruyter, "Augmented reality marketing: A technology-enabled approach to situated customer experience," *Journal of the Academy of Marketing Science*, vol. 28, no. 4, pp. 374-384, 2020. <https://doi.org/10.1007/s11747-019-00700-2>
- [28] P. A. Rauschnabel, B. J. Babin, M. C. tom Dieck, N. Krey, and T. Jung, "What is augmented reality marketing? Its definition, complexity, and future," *Journal of Business Research*, vol. 142, pp. 1140-1150, 2022.

- [29] A. de Regt, K. Plangger, and S. J. Barnes, "Virtual reality marketing and customer advocacy: Transforming experiences from story-telling to story-doing," *Journal of Business Research*, vol. 136, pp. 513-522, 2021.
- [30] H. Sung *et al.*, "Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries," *CA: A cancer journal for clinicians*, vol. 71, no. 3, pp. 209-249, 2021.
- [31] H. Qin, D. A. Peak, and V. Prybutok, "A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making?," *Journal of Retailing Consumer Services*, vol. 58, p. 102337, 2021. <https://doi.org/10.1016/j.jretconser.2020.102337>
- [32] R. Yung, C. Khoo-Lattimore, and L. E. Potter, "VR the world: Experimenting with emotion and presence for tourism marketing," *Journal of Hospitality Tourism Management*, vol. 46, pp. 160-171, 2021. <https://doi.org/10.1016/j.jhtm.2021.01.004>
- [33] V. Arya, R. Sambyal, A. Sharma, and Y. K. Dwivedi, "Brands are calling your AVATAR in metaverse—A study to explore XR-based gamification marketing activities & consumer-based brand equity in virtual world," *Journal of Consumer Behaviour*, vol. 23, no. 2, pp. 556-585, 2024. <https://doi.org/10.1002/cb.2214>
- [34] I. GABELAIA, "The applicability of artificial intelligence marketing for creating data-driven marketing strategies," *Journal of Marketing Research Case Studies*, vol. 2022, no. 466404, 2022. <https://doi.org/10.5171/2022.466404>
- [35] A. M. Ferrick *et al.*, "HRS/EHRA/APHRS/LAHRs expert consensus statement on practical management of the remote device clinic," *Europace*, vol. 25, no. 5, p. eua123, 2023.
- [36] A. T. Rosário and J. C. Dias, "How has data-driven marketing evolved: Challenges and opportunities with emerging technologies," *International Journal of Information Management Data Insights*, vol. 3, no. 2, p. 100203, 2023. <https://doi.org/10.1016/j.jjimei.2023.100203>
- [37] S. Akter *et al.*, "Algorithmic bias in data-driven innovation in the age of AI," *International Journal of Information Management*, vol. 60, p. 102387, 2021. <https://doi.org/10.1016/j.jinfomgt.2021.102387>
- [38] M. A. Camilleri, "The use of data-driven technologies for customer-centric marketing," *International Journal of Big Data Management*, vol. 1, no. 1, pp. 50-63, 2020. <https://doi.org/10.1504/IJBDM.2020.100303>
- [39] S. Yablonsky, "Multidimensional data-driven artificial intelligence innovation," *Technology Innovation Management Review*, vol. 9, no. 12, pp. 16-28, 2019. <https://doi.org/10.22215/timreview/1288>
- [40] K. K. Sharma, M. Tomar, and A. Tadimarri, "AI-driven marketing: Transforming sales processes for success in the digital age," *Journal of Knowledge Learning Science Technology ISSN*, vol. 2, no. 2, pp. 250-260, 2023. <https://doi.org/10.60087/jklst.vol2.n2.p260>
- [41] H. Salhab, M. Allahham, I. Abu-Alsondos, R. H. Frangieh, A. Alkhawaldi, and B. Ali, "Inventory competition, artificial intelligence, and quality improvement decisions in supply chains with digital marketing," *Uncertain Supply Chain Management*, vol. 11, no. 4, pp. 1915-1924, 2023.
- [42] D. S. Wishart *et al.*, "HMDB 5.0: the human metabolome database for 2022," *Nucleic Acids Research*, vol. 50, no. D1, pp. D622-D631, 2022.
- [43] W. E. Kedi, C. Ejimuda, C. Idemudia, and T. I. Ijomah, "AI software for personalized marketing automation in SMEs: Enhancing customer experience and sales," *World Journal of Advanced Research Reviews*, vol. 23, no. 1, pp. 1981-1990, 2024. <https://doi.org/10.30574/wjarr.2024.23.1.2159>
- [44] A. Babet, "Utilization of personalization in marketing automation and email marketing," 2020.
- [45] A. K. Kushwaha and A. K. Kar, "MarkBot—a language model-driven chatbot for interactive marketing in post-modern world," *Information Systems Frontiers*, vol. 26, no. 3, pp. 857-874, 2024. <https://doi.org/10.1007/s10796-021-10184-y>
- [46] M. Wankhade, A. C. S. Rao, and C. Kulkarni, "A survey on sentiment analysis methods, applications, and challenges," *Artificial Intelligence Review*, vol. 55, no. 7, pp. 5731-5780, 2022. <https://doi.org/10.1007/s10462-021-09947-0>
- [47] H.-C. K. Lin, T.-H. Wang, G.-C. Lin, S.-C. Cheng, H.-R. Chen, and Y.-M. Huang, "Applying sentiment analysis to automatically classify consumer comments concerning marketing 4Cs aspects," *Expert Systems with Applications*, vol. 97, p. 106755, 2020. <https://doi.org/10.1016/j.eswa.2017.12.029>
- [48] M. Rodríguez-Ibáñez, A. Casáñez-Ventura, F. Castejón-Mateos, and P.-M. Cuenca-Jiménez, "A review on sentiment analysis from social media platforms," *Expert Systems with Applications*, vol. 223, p. 119862, 2023. <https://doi.org/10.1016/j.eswa.2023.119862>
- [49] E. Kauffmann, J. Peral, D. Gil, A. Ferrández, R. Sellers, and H. Mora, "A framework for big data analytics in commercial social networks: A case study on sentiment analysis and fake review detection for marketing decision-making," *Information & Management*, vol. 57, no. 5, pp. 523-537, 2020. <https://doi.org/10.1016/j.im.2019.103227>
- [50] F. Mehraliyev, I. C. C. Chan, and A. P. Kirilenko, "Sentiment analysis in hospitality and tourism: A thematic and methodological review," *International Journal of Contemporary Hospitality Management*, vol. 34, no. 1, pp. 46-77, 2022. <https://doi.org/10.1108/IJCHM-02-2021-0132>
- [51] A. Panchal, A. Shah, and K. Kansara, "Digital marketing-search engine optimization (SEO) and search engine marketing (SEM)," *International Research Journal of Innovations in Engineering Technology*, vol. 5, no. 12, p. 17, 2021.
- [52] T. Kumar, "Integration of intelligent AI & SEO: A review of various factors," *International Journal of New Media Studies*, vol. 10, no. 1, pp. 64-67, 2023. <https://doi.org/10.5281/zenodo.7721230>
- [53] D. D. Umamaheswari, "Role of artificial intelligence in marketing strategies and performance," *Migration Letters*, vol. 21, no. S4, pp. 1589-1599, 2024. <https://doi.org/10.33182/ml.v21iS4.7579>
- [54] D. R. Alqurashi, M. Alkhaffaf, M. K. Daoud, J. Al-Gasawneh, and M. Alghizzawi, "Exploring the impact of artificial intelligence in personalized content marketing: A contemporary digital marketing," *Migration Letters*, vol. 20, no. S8, pp. 548-560, 2023. <https://doi.org/10.59670/ml.v20iS8.4630>
- [55] S.-F. Hsu and S. Liou, "Artificial intelligence impact on digital content marketing research," in *2021 9th International Conference on Orange Technology (ICOT)*, 2021, pp. 1-4.
- [56] B. Barbosa, J. R. Saura, S. B. Zekan, and D. Ribeiro-Soriano, "RETRACTED ARTICLE: Defining content marketing and its influence on online user behavior: A data-driven prescriptive analytics method," *Annals of Operations Research*, vol. 337, no. Suppl 1, pp. 17-17, 2024.

- [57] A. Edeling, S. Srinivasan, and D. M. Hanssens, "The marketing–finance interface: A new integrative review of metrics, methods, and findings and an agenda for future research," *International Journal of Research in Marketing*, vol. 38, no. 4, pp. 857-876, 2021.
- [58] Y. Li *et al.*, "NTIRE 2023 challenge on efficient super-resolution: Methods and results," in *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 1922-1960)*. 2023.
- [59] P. Rivas and L. Zhao, "Marketing with chatgpt: Navigating the ethical terrain of gpt-based chatbot technology," *AI*, vol. 4, no. 2, pp. 375-384, 2023. <https://doi.org/10.3390/ai4020019>
- [60] M. Tanveer, A.-R. Ahmad, H. Mahmood, and I. U. Haq, "Role of ethical marketing in driving consumer brand relationships and brand loyalty: A sustainable marketing approach," *Sustainability*, vol. 13, no. 12, p. 6839, 2021. <https://doi.org/10.3390/su13126839>
- [61] D. Kumar and N. Suthar, "Communication ethics in society," *Journal of Information, Communication and Ethics in Society*, vol. 22, no. 1, pp. 124-144, 2024. <https://doi.org/10.1108/JICES-05-2023-0068>
- [62] G. Volkmar, P. M. Fischer, and S. Reinecke, "Artificial intelligence and machine learning: Exploring drivers, barriers, and future developments in marketing management," *Journal of Business Research*, vol. 149, pp. 599-614, 2022. <https://doi.org/10.1016/j.jbusres.2022.05.029>
- [63] M. S. Motadi, "Harnessing AI for ethical digital consumer behavior analysis enhancing and predicting digital consumer behavior with AI," IGI Global, 2024, pp. 211-237.
- [64] O. Ferrell and L. Ferrell, "New directions for marketing ethics and social responsibility research," *Journal of Marketing Theory Practice*, vol. 29, no. 1, pp. 13-22, 2021. <https://doi.org/10.1080/10696679.2020.1860686>
- [65] W. H. Kunz and J. Wirtz, "Corporate digital responsibility (CDR) in the age of AI: Implications for interactive marketing," *Journal of Research in Interactive Marketing*, vol. 18, no. 1, pp. 31-37, 2024. <https://doi.org/10.1108/JRIM-05-2023-0152>
- [66] A. De Bruyn, V. Viswanathan, Y. S. Beh, J. K.-U. Brock, and F. Von Wangenheim, "Artificial intelligence and marketing: Pitfalls and opportunities," *Journal of Interactive Marketing*, vol. 51, no. 1, pp. 91-105, 2020. <https://doi.org/10.1016/j.intmar.2020.04.007>
- [67] L. Ma and B. Sun, "Machine learning and AI in marketing–connecting computing power to human insights," *International Journal of Research in Marketing*, vol. 37, no. 3, pp. 481-504, 2020. <https://doi.org/10.1016/j.ijresmar.2020.01.001>
- [68] P. Mikalef, K. Conboy, and J. Krogstie, "Artificial intelligence as an enabler of B2B marketing: A dynamic capabilities micro-foundations approach," *Industrial Marketing Management*, vol. 98, pp. 80-92, 2021. <https://doi.org/10.1016/j.indmarman.2021.08.003>
- [69] Q. Cheng *et al.*, "Can ai assistants know what they don't know?," in *Proceedings of the 41st International Conference on Machine Learning*, 235, 8184–8202. <https://doi.org/10.48550/arXiv.2401.13275>, 2024.
- [70] Z. C. Jin *et al.*, "Immune checkpoint inhibitors and anti-vascular endothelial growth factor antibody/tyrosine kinase inhibitors with or without transarterial chemoembolization as first-line treatment for advanced hepatocellular carcinoma (CHANCE2201): a target trial emulation study," *EClinicalMedicine*, vol. 72, 2024.
- [71] R. Bissonnette *et al.*, "An oral interleukin-23–receptor antagonist peptide for plaque psoriasis," *New England Journal of Medicine*, vol. 390, no. 6, pp. 510-521, 2024.
- [72] P. Xu *et al.*, "Lvlm-ehub: A comprehensive evaluation benchmark for large vision-language models," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2024.
- [73] R. Hadi, S. Melumad, and E. S. Park, "The Metaverse: A new digital frontier for consumer behavior," *Journal of Consumer Psychology*, vol. 34, no. 1, pp. 142-166, 2024.
- [74] A. Qayyum *et al.*, "Innovation: Technology, market, and complexity."
- [75] M. Yin, S. Jiang, and X. Niu, "Can AI really help? The double-edged sword effect of AI assistant on employees' innovation behavior," *Computers in Human Behavior*, vol. 150, p. 107987, 2024. <https://doi.org/10.1016/j.chb.2023.107987>
- [76] J. Remondes, P. Madeira, and C. Alves, *Connecting with consumers through effective personalization and programmatic advertising*. IGI Global, 2024.
- [77] R. Koswara and F. I. Alifin, "A User-oriented UI/UX application design using the integration of quality function deployment (qfd) and design thinking methods," *MOTIVATION: Journal of Mechanical, Electrical and Industrial Engineering*, vol. 6, no. 1, pp. 85-100, 2024.
- [78] M. Ablikim *et al.*, "Measurement of integrated luminosity of data collected at 3.773 GeV by BESIII from 2021 to 2024," *Chinese Physics C*, vol. 48, no. 12, p. 123001, 2024.
- [79] P. Harika, K. Sravani, G. Shanthi, M. B. Jaffery, K. R. Sai, and S. S. Vali, "Comprehensive analysis of fully depleted and partially depleted silicon-on-insulator FET device," *Microsystem Technologies*, pp. 1-16, 2024.
- [80] J. Xu *et al.*, "Sintilimab plus chemotherapy for unresectable gastric or gastroesophageal junction cancer: the ORIENT-16 randomized clinical trial," *Jama*, vol. 330, no. 21, pp. 2064-2074, 2023.
- [81] D. E. Kendzor *et al.*, "Financial incentives for smoking cessation among socioeconomically disadvantaged adults: a randomized clinical trial," *JAMA Network Open*, vol. 7, no. 7, pp. e2418821-e2418821, 2024.
- [82] S. S. Gill *et al.*, "AI for next generation computing: Emerging trends and future directions," *Internet of Things*, vol. 19, p. 100514, 2022.
- [83] P. Tirandazi, A. Rahiminasab, and M. J. Ebadi, "An efficient coverage and connectivity algorithm based on mobile robots for wireless sensor networks," *Journal of Ambient Intelligence and Humanized Computing*, pp. 1-23, 2023.
- [84] R. Andorno and A. Lavazza, "How to deal with mind-reading technologies," *Frontiers in Psychology*, vol. 14, p. 1290478, 2023. <https://doi.org/10.3389/fpsyg.2023.1290478>
- [85] S. Rainey, S. Martin, A. Christen, P. Mégevand, E. J. S. Fournieret, and e. ethics, "Brain recording, mind-reading, and neurotechnology: Ethical issues from consumer devices to brain-based speech decoding," *Science and Engineering Ethics*, vol. 26, pp. 2295-2311, 2020. <https://doi.org/10.1007/s11948-020-00218-0>