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The Impact Of AI And Metaverse In The Development Of Green Marketing

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Abstract

The convergence of green marketing and artificial intelligence (AI) presents a dynamic intersection between environmental sustainability and technological innovation. Green marketing focuses on promoting eco-friendly products, sustainable practices, and initiatives that appeal to an increasingly environmentally conscious consumer base. Meanwhile, AI, with its advanced algorithms and predictive capabilities, has the potential to revolutionize marketing strategies.

This paper examines the dynamic evolution of green marketing, highlighting the intersection of sustainability, artificial intelligence (AI), and the emerging metaverse. It explores AI's transformative role in enhancing green marketing strategies through predictive analytics and data-driven insights. Additionally, the metaverse offers innovative opportunities for sustainable marketing by enabling immersive and interactive consumer experiences without placing additional strain on the physical environment.

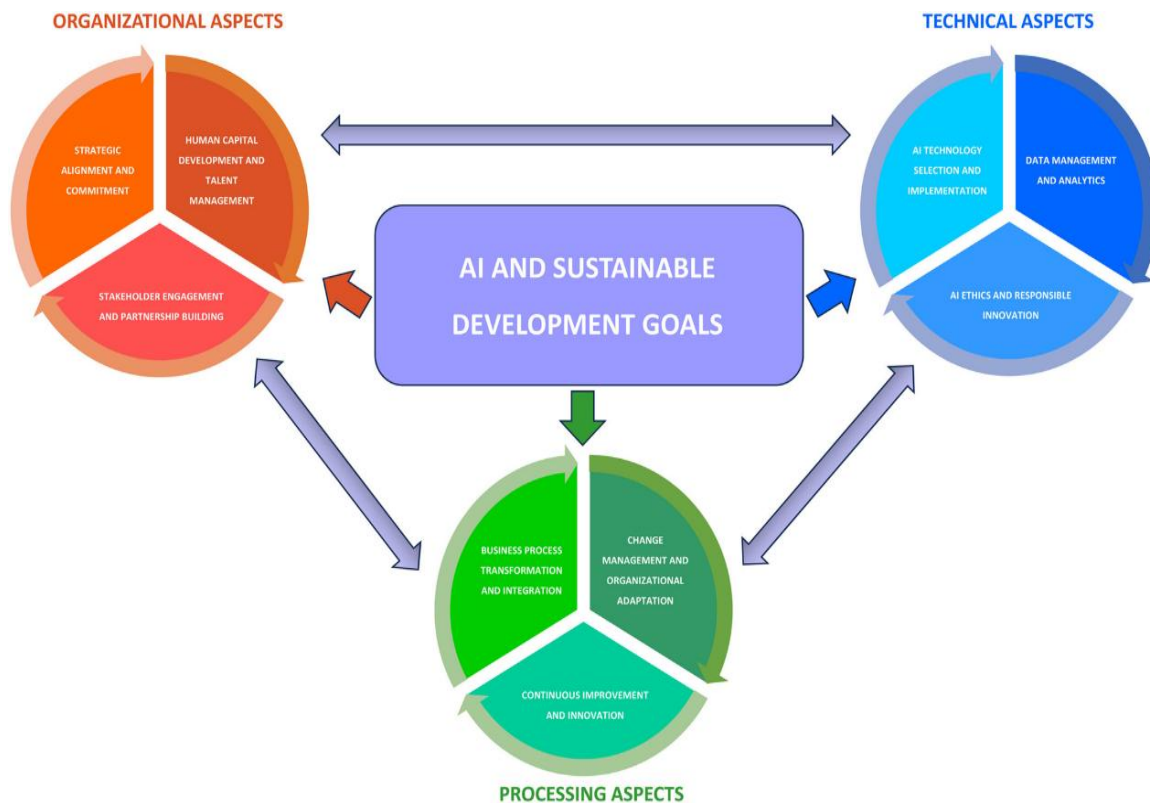
The study integrates these three elements to provide a holistic perspective on the potential future trends shaping green marketing. Beginning with an overview of green marketing, the discussion transitions into the evolution of AI and its transformative role in advancing sustainable marketing practices. The paper concludes with practical recommendations for leveraging AI-driven strategies to enhance green marketing efforts.

Keywords: Green marketing, artificial intelligence, metaverse

1. Introduction

Green marketing involves the promotion and sale of products or services based on their environmental benefits. As a strategic approach, businesses leverage it to attract an expanding base of eco-conscious consumers. Beyond showcasing environmental responsibility, these efforts seek to revolutionize production processes, minimize waste, and encourage sustainable consumption. In this way, green marketing emerges as a powerful driver of positive environmental change. Marketing is important for the growth of the business and improving its competitive position, because almost the same business marketing tools can influence customers (Oliveira and Luce, 2020; Jamil et al., 2022). Technological developments, changes in customer preferences, etc. Due to this, the way of thinking and approach to business (from focusing on production to focusing on social and ethics) has changed a lot. (Storbacka and Moser, 2020; Rangaswamy et al., 2020). years; Veckalne and Tambovceva, 2022). New models and ideas have emerged (Morin, 2011; Rosokhata et al. , 2021), the principles of using work tools have been redefined, and new models and concepts have been tried (Thaichon et al. , 2022; Letunovska et al. , 2021). The development of new technologies has led to the emergence of new advertising and marketing tools. (Letunovska et al., 2021). In today's environment, it is more important to use artificial intelligence (AI) to improve the results of advertising campaigns Marr (2022).

In recent years, AI has emerged as a transformative force in marketing, offering unprecedented capabilities to analyze vast amounts of data, personalize customer experiences, and automate repetitive tasks. This technological advancement has led to a paradigm shift in how businesses engage with their target audience, optimize campaigns, and drive sales. By leveraging AI-powered tools and algorithms, marketers can gain deeper insights into consumer behavior, segment audiences more effectively, and deliver highly targeted and relevant content. Moreover, AI enables predictive analytics, allowing marketers to anticipate customer needs and preferences, thereby enhancing customer satisfaction and loyalty. However, the integration of AI in marketing also raises ethical considerations, such as data privacy and algorithmic bias, which need to be addressed to maintain consumer trust and regulatory compliance. Therefore, this study seeks to explore the multifaceted impact of AI on marketing development, examining its benefits, challenges, and implications for businesses and consumers alike. Through a comprehensive analysis of industry trends, case studies, and expert insights, this research aims to provide valuable insights and recommendations for organizations looking to harness the power of AI in their marketing strategies effectively.



[Ignat Kulkov](#), [Julia Kulkova](#), [Rene Rohrbeck](#), [Loick Menvielle](#), [Valtteri Kaartemo](#), [Hannu Makkonen](#) (2024), Artificial intelligence - driven sustainable development: Examining organizational, technical, and processing approaches to achieving global goals, *Sustainable development*, 32, 2253-2267

In his research, Morgan, et al., (2019) not only points out significant issues with marketing strategy research but also offers numerous chances to generate concepts that are better in line with contemporary concerns. A research investigation on consumer experience of trade recommendations was undertaken by Shen (2022). He claims that in order to analyze marketing strategies specifically for you, academics might come up with a novel concept known as the consumer perspective (McKinsey & Company, 2023). To determine the appropriate quality as well as indicators for a significant data marketing strategy, (Kim, 2014) performed research. Using the Q approach, he concentrated on the effects of AI and the analysis of big data from a commercial standpoint. In order to spot trends in these fields, Amado et al., (2018) examined the use of big data for marketing. His research has demonstrated that there has been an increasing curiosity in big data marketing throughout time. Therefore, for instance, for Big Data to develop in the Marketing industry, business efforts must be increased.

Many companies are using AI in some form, which allows them to improve their business capabilities. There are also companies that provide such services and develop their own intelligence technology. There are also

many applications available for free that allow you to evaluate your daily intellectual capacity and benefit from some improvements at work or in education. As the following research will show, using AI in business operations improves performance indicators and leads to better financial results. Generally speaking, artificial intelligence refers to the ability of machines to perform tasks usually associated with humans, such as learning, analyzing data, drawing conclusions, making decisions, and others (Krenn et al., 2022). Companies use many different types of these applications, for example, for consumer electronics, business process management, sales, forecasting, and other things. (Devang et al., 2019).

Therefore, it is important to evaluate the results and application possibilities of these methods. In this study, the authors focus on how artificial intelligence is used in reporting and analyzing current events. This study aims to investigate: whether there is a significant difference in the understanding of AI-generated advertising from human-made advertising; Find opportunities to use technology to improve the performance of the company operations and draw conclusions about the benefits of using AI technology , this study also adds information about the practical use of intelligence and the future use of this technology in the process of life, which is the new way of working.

2. Research Methodology

The methodology employed in this study was based on secondary research to foster a comprehensive understanding of the three study areas: sustainability, artificial intelligence, and the metaverse, in the context of green marketing. The secondary research was carried out under two stages; the first stage involved identifying suitable literature by using precise criteria, and the second stage revolved around a careful analysis and synthesis of the collated information.

3. Results and Discussion

3.1. Implementations of AI in Marketing Includes:

- (i) **AI in Advertising:** AI-powered tools can analyse facial expressions and vocal intonations to gauge consumer emotions in response to advertisements. This data helps marketers understand how their ads are perceived and adjust enhance emotional engagement. To understand the elements that contribute to the successful combination of AI and marketing, Shahid &Li, (2023) conducted a quality study in cooperation with marketing specialists from different organizations. His research has brought attention to the advantages of incorporating AI into marketing; however, technical interoperability has been a significant obstacle (Khodabandehlou & Zivari Rahman, 2023). Overgoor et al., (2023) elaborated on engineering benchmark Processes for Data Mining structures be able to be used in improving

Artificial Intelligence Solutions in selling problems. He demonstrated his thoughts with the intriguing study of mechanical score Images for Online Marketing. Ramya et al., (2019), in his research, reviewed various factors that influence consumer behavior. Products have the occasion to create an approach and promotion communication tailored to you by identifying and considering the factors that will affect their clients. Raunaque et al., (2020) study focuses on what online shoppers think about when shopping online. Her findings also include how their protection, security, and confidentiality regarding digital marketing affect digital shopping performance. AI combined with blockchain technology can provide transparent and fraud-resistant ad verification solutions. These solutions ensure that marketers' ads are displayed in brand-safe environments and reach their intended audiences without the risk of ad fraud or manipulation.

A detailed study of the use of artificial intelligence in business can be found in the work of Haleem et al. (2022). Twenty-three different opportunities are identified for the use of artificial intelligence in marketing campaigns. For example, identifying the target audience, determining better feedback data, improving customer experience, etc. (these are explained as mentioned in the section below). Although researchers write about the promise of artificial intelligence in advertising, they seem to forget the fact that the technology can create its own ads, create posters, and create photos and videos for advertising and marketing. Researchers only talk about AI's ability to analyze big data and publish programs that humans can create better, but that ignores the over-the-hill potential. The same applies to the works of Buch and Thakkar (2021) and Yu (2021), who also consider the possibility of using intelligence in business, but do not mention the possibility of creating their own personal videos or audio ads. There are also few studies determining the effectiveness of AI-generated ads and how consumers perceive them. Kumari (2021) examined the role of intelligence in business. The scientist has many ways to use this technology and shows the results that can be achieved with the help of intelligence. Kumari pointed out that artificial intelligence is the future of this industry. Huang and Rust (2020) also describe the use of intelligence in the development of marketing strategies (segmentation, targeting and positioning), research (data collection, market analysis, understanding customers) and activities (standard, personal, social). opportunities. Scientists say that artificial intelligence's ability to make observations beyond the human mind is one of the biggest changes, that its use will not be possible in the future, but its use now is important for economic development. In his study, Sama (2019) analyzed the impact of different media types (such as television, newspapers, magazines and radio) on consumer behavior.

Researchers have determined the characteristics and consequences of the impact of each type of advertising on consumers: it is best to advertise on television, the most effective is radio, which explains the increase in the cost of advertising using different sources. (Jogi & Vashisth, 2021) introduced online advertising in more detail, focusing on the level of effectiveness and customer needs. In general, many different publications on this topic can be found in the public domain with a comprehensive literature review (Veiga and Diogo, 2022). But they didn't mention using intelligence to create advertising. This is because there are not many studies in the literature on the effectiveness of intelligence-based advertising: in general, they are theoretical results that only innovation can explain, without any statistical analysis.

- (ii) **AI in Visual creation and Voice Search Optimization:** AI algorithms enable visual and voice search capabilities, allowing users to search for products using images rather than text. Marketers can optimize product images and metadata to improve visibility and conversion rates in visual search results. Frank Chen, a Venture Capitalist, has divided AI into five categories: rational consultation, information representation, scheduling and steering, language processing and sensitivity, etc. The multiplicity of automation problem and solution as well as makes the basis of AI in individual testing for presentation and accurateness of algorithm to make it more difficult to evidently describe the clear linear differences between what constitutes Artificial technology application and what does not exist”. Artificial Intelligence is a technology to facilitates and enables machines to execute tasks that are based on decisions that have been left to humans in the past. It manifests itself in many ways, including machine-based learning, which can continue to improve in analysis and decisions when used most, and speech-based technology, which can understand a variety of words and different languages. With the growing popularity of voice-enabled devices and virtual assistants, AI-driven voice search optimization is crucial for marketers. Optimizing content for voice search queries requires understanding natural language patterns and conversational search intent.

Currently, the intellectual property market is not widespread and only a few companies are involved in this market. The first thing worth mentioning is the neural network called Make-a-Video developed by Meta developers. It allows the production of short films based on short descriptions: the famous work, which can be found on the official website, is the video "A Confused Brown Bear in the Math Class", "A Knight's Trip to the Village" (2022). The developers of the program are Singer et al. (2022) describe their design in detail. Research shows the characteristics of reading and turning it into

pictures. However, artificial intelligence needs to undergo training and education before it is put into use. Developers continue to work on this technology and will improve its results and open new possibilities to it. They will create the possibility of creating multiple scenes in a movie at the same time (only one is currently available) and increase the accuracy of reading. Overall, this development has some hope for future business, but now it needs to be improved and business expanded. Google has a similar development called Imagen Video. This enhancement can also create photos and short videos (up to 5 seconds), but the principle is different from Make Video.

What a person. (2022) describe the model used and provide several examples of their work. They also noted significant opportunities for further development and mixed use. This technology has advantages and disadvantages over Make-a-Video, so at this stage of its development it is difficult to say which is better. However, now a completely different development is taking place. As a result, other developers in the US may create an AI Soundify system that can add sound to videos without sound. This method was also used by Lin et al. (2022). To achieve this result, the authors analyzed sound (sound emitting) objects and environments, creating a database of more than 90,000 sound qualities that can be applied to video.

This technology can be done with the two technologies discussed above (Make-a-Video and Imagen Video) because it can add audio to the videos they create. However, at this stage improvements still need to be made by increasing audio data storage and improving audio quality. Another company is OpenAi and ChatGPT, an intelligent chatbot that can hold conversations on various topics, answer questions, and most importantly create custom messages based on information on the website. Since the technology has recently become free, it is not yet clear how it will be used. So far, the following can be identified: writing custom articles (including business articles), helping to find information for preparing courses, providing psychotherapeutic services, etc. Currently, the manufacturing industry is growing very fast: revenue estimated at \$29 billion is expected to reach \$1 billion in 2024 (Halytskyi, 2023).

In 2022, Midjourney, a product that specializes in creating visuals of people's handwriting, will be operational. According to records, the intelligence produces four images from which people can choose one. Variations of these images are then created until people make a satisfactory choice. DALL-E 2 also has a similar feature; This allows you to create images based on the text you enter or add some details to the photos or images you send. It is worth noting that it can create a fair image if you specify in the text many variables on which this process will depend. In the future, it could be used to create

custom paintings or drawings that would increase the value of the job market without the need for an artist. On the other hand, it can be a good source of inspiration for designers and others because sometimes the images it creates are unique and can inspire new ideas. IBM Watson Advertising calculations. The company offers many services to its partners to create digital marketing plans and engage with people. This technology is Marketing and Innovation Management, 1, 2023 and can show its benefits when working with other companies, though not like Make-a-Video, Imagen Video, or Soundify. So, given the influence of the region, the speed of spread, and the use of AI technology, we explored how consumers respond to ads created by AI and humans.

It is worth noting that direct communication through intelligence is rarely used today; Actually, there are not many examples of this application. In general, intelligence can be used to improve the ability to create ads on specific platforms such as Facebook, Instagram or Google, Yu (2021). However, it is worth considering what examples of AI advertising exist. The most famous of these is the advertisement created by Lexus Ibrahim using technology (2018). IBM Watson Publishing has been training AI in advertising for the last 15 years, and the AI later wrote the script for the movie directed by Kevin Macdonald Meedway (2018). The film itself is very different: It tells the story of the creation of the ES model followed by the producers and its lead up to the accident. This advertising campaign using artificial intelligence can be considered the most desired. Another example of artificial intelligence used in advertising is personalization.

- (iii) **Augmented Reality (AR) Try-On Experiences:** AI-powered AR technology allows consumers to virtually try on products like clothing, accessories, and cosmetics in real-time. Marketers can leverage AR try-on experiences to enhance engagement, reduce returns, and drive conversions.

Jeya Rani & Thangaraja (2019) the marketing intelligence platform analyses how to best support the banking system and consumers in applying cutting-edge technological upgrades that various banks embrace in order to operate more effectively by luring new clients, educational institutions, and assessment processes.

- (iv) **Sentiment Analysis in Customer Feedback:** AI-driven sentiment analysis tools can automatically analyze customer feedback from various sources, such as social media, reviews, and surveys. Marketers use this data to understand customer sentiment, identify trends, and improve brand perception. Ajanthan, (2023) is evaluating and identifying the effects of social media marketing on product

ratings with the following primary criteria: product dependability, product awareness, product image, and visual quality. Thangaraja, (2023) is an ongoing and dynamic structure of people, tools, and processes in marketing that happens in real time. Together, they process timely, accurate, and pertinent information that marketing decision-makers can use to advance the development of their marketing strategies. Professionals accumulate and assess a lot of data on their own, but they still need to make sure that the marketing intelligence system is focused. Advanced AI algorithms can generate content such as blog posts, product descriptions, and social media captions based on user input or specific parameters. Marketers can use AI-generated content to supplement their existing content strategy and scale content production.

Ozcelik & Varnali, (2019) goes into detail about how recipients' psychological and behavioral interpretation affects the efficacy of internet-tailored adverts. Thangaraja (2020) The distributors always favor social media for information gathering and order collection in order to build a marketing intelligence system that will allow the distributors to make more informed and reliable decisions. Abid et al., (2022) studied the impacts of various content components and allusions on online fan dialogues and the implications of content management. You have discussed the significance of content marketers in creating stronger online relationships.

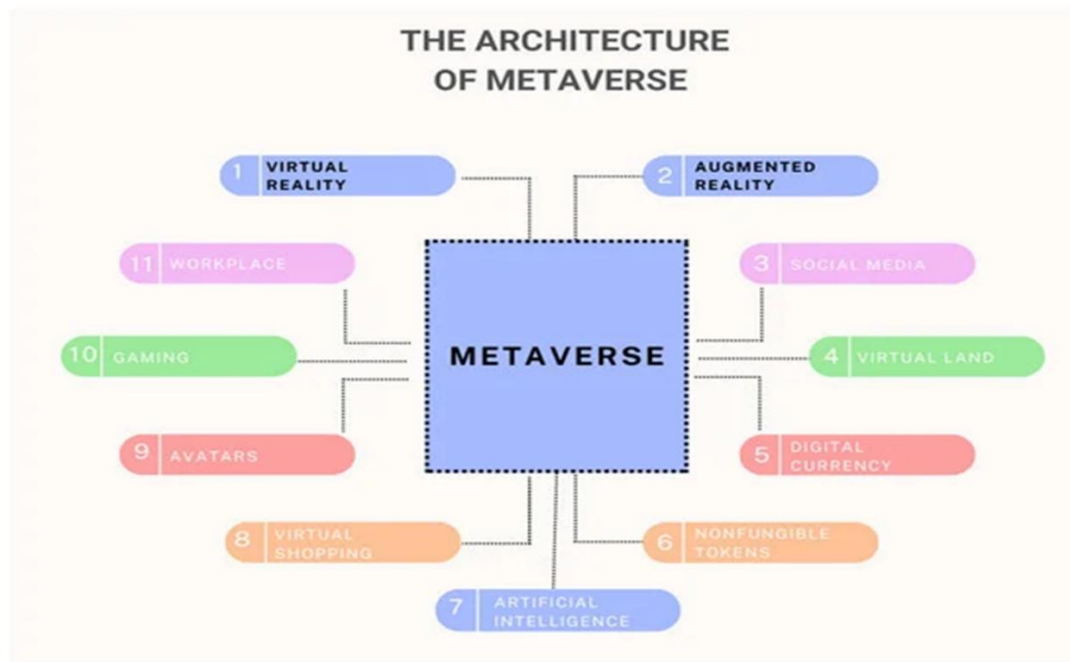
- (v) **Neuro marketing Research:** AI technologies, such as EEG (electroencephalogram) headsets and eye-tracking devices, enable neuro marketing research to measure consumer brain activity and eye movements in response to marketing stimuli. This data provides valuable insights into subconscious consumer preferences and decision-making processes. One of the topics discussed in this study is the concept of neuromarketing. It became popular over time: Vences et al. (2020) describe neuromarketing as an important framework for improving the relationship and understanding between businesses and customers (in communication only). This issue is discussed in more detail in the work of Bockova et al. (2021) and Sydorov and Petropavlovkaya (2021), who address the theoretical and ethical aspects of this concept, respectively. (Emic & Cabro, 2019; Mouammine & Azdimousa, 2019; Ziabina & Dzwigol-Barosz, 2022; Kuzior et al., 2022) examined the interaction between neuromarketing and artificial intelligence and stated that neuromarketing will increase one of the most professional methods. . Marketing in business today is neuromarketing, a layer of human behavior learning based on the study of human behavior and behavioral responses (Bokova et al., 2021). This concept is particularly relevant to social media (Vences et al., 2020). Neuromarketing has emerged differently from classical and

other theories under the influence of modern developments in marketing. It is logical to assume that consumers purchase products that are most beneficial to them in terms of price/performance.

However, today consumers have too much information about products, making it difficult to make objective decisions. Inefficient marketing leads consumers to buy products that are not the most useful to them, but that they have heard of more often and trust more. Therefore, the price and quality of the product became less and less important, and companies began to devote more time to researching new ways to promote the product. Therefore, neuromarketing was born, which tries to convey specific messages to customers (taking into account their interests and interests). “playing”) with their behavior), which makes the company's products more competitive according to Sola (2013). The concept has both supporters who see neuromarketing as a revolutionary discipline and opponents who believe it is nothing more than misleading consumers. Neuromarketing is a new discipline that complements existing marketing theories, but also provides users with powerful new Marketing and Business Management. According to researchers, especially Sydorov and Petropavlovkaya (2021), companies using neuromarketing should not try to persuade customers, that is, the use of neuromarketing should be fair. Considering the nature of neuromarketing, it can be concluded that with further development and more effort, the use of this strategy could become more effective. With AI's ability to analyze big data, marketers will be able to gain valuable information about consumer behavior and taste in advertising, product development and product analysis, which will enable them to make better decisions and conclusions (Mouammine & A Zidi Moussa, 2019). AI-driven dynamic pricing algorithms analyze market conditions, competitor pricing, and customer behavior in real-time to adjust prices dynamically. This approach maximizes revenue and profit margins while remaining competitive in the market.

3.2. Predictive Lead Scoring with AI: AI-powered predictive lead scoring models analyze historical customer data to identify the most promising leads likely to convert. Marketers can prioritize these leads for targeted campaigns, resulting in more efficient sales and marketing efforts. Economist (2021) introduces different varieties of prediction in addition to automation strategies that can be useful for trade forecasting. In his research, he explored other existing AI methods that seemed profitable and promising to predict business. Thangaraja (2023) made findings on how marketing intelligence can be significantly developed. In many distributor's points, they do not outperform the competitors since they are utilized as a carrier to deliver the inventory requirements. According to Columbus, (2022) the use of AI in conjunction with ML, Big Data, and Data Analytics will result in predictions that are more accurate than those made using any

other technique. He addressed the costs and cybersecurity risks associated with AI's limitations, including their impact on power forecasts. In his research, Malhotra & Peterson, (2022) brings together academics and medical professionals to examine the problem and emerging trends that can highlight the value of marketing research.



Vlăduțescu Ș, Stănescu GC. Environmental Sustainability of Metaverse: Perspectives from Romanian Developers. *Sustainability*. 2023; 15(15):11704. <https://doi.org/10.3390/su151511704>

3.3. Interconnection of AI, Metaverse and Sustainability

Artificial Intelligence and the Metaverse: A Pathway to Sustainability

In conceptual terms, artificial intelligence holds significant potential to contribute to the environmental sustainability of the metaverse. By enhancing energy efficiency across various digital infrastructures, AI can play a key role in minimizing the ecological impact of immersive virtual environments. Through the application of advanced optimization techniques, AI can streamline the performance of servers, data centres and end-user devices. These improvements translate to lower electricity consumption while maintaining, or even enhancing, the quality and realism of virtual experiences.

Beyond operational efficiency, AI may also serve as a guiding force for embedding environmentally responsible practices within the architecture of the metaverse itself. For instance, it could be used to design systems that promote virtual recycling or to simulate the integration of renewable energy

sources within digital platforms. In this way, AI becomes not just a technical asset but a strategic tool for fostering sustainable digital ecosystems.

An Integrated example of HP (Hewlett-Packard)-centric innovative product examples that demonstrate the interconnection of AI, the Metaverse, and Sustainability, aligning with the company's legacy in computing, printing, and sustainable technology.

3.3.1. HP MetaLab Workstation Ecosystem is a line of AI-accelerated workstations optimized for metaverse development with a strong focus on energy efficiency and material recyclability.

HP is using Integrated AI chips for real-time 3D rendering, workload prediction, and adaptive power management. It Enables creators and developers to build and navigate virtual environments seamlessly.

They are Sustainably designed with up to 80% recycled materials and smart thermal management to reduce power use with a Sustainability Tagline: "Create the future, consciously."

3.3.2. HP EcoVerse: Virtual Collaboration for Green Innovation is a metaverse platform for enterprises to collaborate on sustainable product design and innovation in a virtual environment powered by HP technologies which Tracks and analyzes design sustainability (e.g., lifecycle analysis, carbon impact).Which includes Metaverse Roles like Shared VR spaces for design thinking, prototyping, and real-time feedback. Sustainably it reduces the need for travel and physical prototyping, saving resources.

3.3.3. HP Smart Print AI with Virtual Office Integration It is an AI-driven, cloud-connected printing systems embedded in metaverse office spaces, allowing hybrid workers to manage print operations virtually. It helps in predicts printing needs, suggests paper-saving layouts, and automates duplex printing. Users interact with printers and document workflows via virtual office interfaces.

It's Sustainability Impact, Significantly reduces unnecessary printing and supports HP's Forest Positive initiatives.

3.3.4. HP Circularity Hub: A Metaverse Education Platform is a virtual learning environment for consumers and businesses to explore sustainable practices and circular economy strategies using HP's products. It Customizes learning paths based on user behaviour and sustainability goals.Interactive 3D simulations and gamified experiences around e-waste, recycling, and green tech.

The Sustainability Impact includes: Educating users, promotes product recycling and encourages sustainable tech habits with minimal e-waste.

3.3.5. HP ReGen: AI-Optimized Device Lifecycle Management in the Metaverse: An enterprise platform combining digital twins of devices in the metaverse

with AI to monitor usage, predict wear, and recommend sustainable disposal or refurbishing. Uses predictive analytics to suggest optimal reuse, recycling, or energy-saving configurations. Visualizes asset status and sustainability metrics in 3D virtual dashboards.

3.4.Importance of AI & Metaverse in the Field of Marketing: A brief description of how different companies use this technology and their effectiveness is shown in Table 1.

COMPANY	USAGE CASE	EFFECT
McDonald's	Encouraging consumers to visit them Restaurants	Reduction of the price per visit by 168%
Best Western	Personalization of advertising with the help of AI from IBM Watson Advertising	Increased customer interaction time by 2.2 times Increase in website traffic with sales by 48.6%
CVS Pharmacy	Engaging consumers in regions with a high risk of influenza	Attracting 42 million visitors 644 million ad impressions Increase in the number of clicks on ads (CTR - clickthrough rate) by 120%
Walgreens	Identify potential customers based on weather conditions	379.98% increase in in-store traffic with native advertising
TruGreen	Create ads and optimize solutions based on collected user data	Increase the CTR level by 4 times Visitors stay on the site for 2 minutes longer

4. Conclusion:

Metaverse as a Catalyst for Sustainable Engagement: The concept of green marketing is undergoing a notable transformation. Sustainability is no longer viewed as a niche or peripheral initiative within marketing strategies—it is becoming an integrated ethos that shapes every aspect of brand communication and consumer engagement. Rather than simply promoting products as "eco-friendly," marketers are embedding sustainable values into the fabric of their campaigns, operations, and customer experiences.

Artificial Intelligence is emerging as a powerful tool in this evolution. Through sophisticated data analysis and behavior prediction, AI enables brands to tailor environmentally responsible offerings that align with individual consumer values. Additionally, AI technologies are proving valuable in evaluating the ecological implications of strategic decisions, allowing businesses to navigate toward options that minimize environmental harm. This fusion of AI and sustainability is helping redefine the future of marketing—one that is both intelligent and ethically driven.

The study reveals that the metaverse opens compelling new avenues for advancing green marketing strategies. Immersive digital environments provide brands with innovative tools to communicate their environmental values in more engaging and impactful ways. Rather than relying solely on traditional media, companies can now craft virtual experiences that highlight their commitment to sustainability—offering consumers a deeper, firsthand look into their eco-conscious operations. Through interactive showcases and virtual storytelling, organizations can foster transparency and build trust around their environmental initiatives.

References:

- Abid Haleem, Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Agrawal, A., McHale, J., & Oettl, A. (2024). Artificial intelligence and scientific discovery: A model of prioritized search. *Research Policy*, 53(5), 104989. <https://doi.org/10.1016/j.respol.2024.104989>
- Amado, A., Cortez, P., Rita, P., & Moro, S. (2018). Research trends on big data in marketing: A text mining and topic modeling based literature analysis. *European Research on Management and Business Economics*, 24(1), 1–7. <https://doi.org/10.1016/j.iedeen.2017.06.002>
- Chintalapati, S., & Pandey, S. K. (2022). Artificial intelligence in marketing: A systematic literature review. *International Journal of Market Research*, 64(1), 38–68. <https://doi.org/10.1177/14707853211018428>
- Ezzat, R. (2024). Enhance the advertising effectiveness by using artificial intelligence (AI). *Journal of Art, Design and Music*, 3(1), Article 1. <https://doi.org/10.55554/2785-9649.1021>
- Jamil, K., Dunnan, L., Gul, R. F., Shehzad, M. U., Gillani, S. H. M., & Awan, F. H. (2022). Role of social media marketing activities in influencing customer intentions: A perspective of a new emerging era. *Frontiers in Psychology*, 12, 808525. <https://doi.org/10.3389/fpsyg.2021.808525>

- Khodabandehlou, S., & Zivari Rahman, M. (2017). Comparison of supervised machine learning techniques for customer churn prediction based on analysis of customer behavior. *Journal of Systems and Information Technology*, 19(1/2), 65–93. <https://doi.org/10.1108/JSIT-10-2016-0061>
- Khomenko, L., Rosokhata, A., & Jasniewski, A. (2021). Analysis of territories marketing activities among small and medium business: A bibliometric analysis. *Marketing and Management of Innovations*, 4, 184–195. <https://doi.org/10.21272/mmi.2021.4-14>
- Marr, B. (2022, September 24). The 7 biggest artificial intelligence (AI) trends in 2022. *Forbes*. <https://www.forbes.com/sites/bernardmarr/2021/09/24/the-7-biggest-artificial-intelligence-ai-trends-in-2022/?sh=7ff9a6dc2015>
- Nausherwan, R., Jibrán, S., & Preeti, P. (2017). The study of factors affecting consumer preferences of shopping at organized retail stores in Delhi NCR. *International Journal of Advanced Engineering Management and Science*, 3(3), 271–276. <https://doi.org/10.24001/ijaems.3.3.22>
- Overgoor, G., Bart, Y., Pauwels, K., & Yildirim, G. (2023). Increased attention to racial inequality alters consumer responses to Black actor representation in TV advertising. *Northeastern U. D'Amore-McKim School of Business Research Paper No. 4471248*. <https://doi.org/10.2139/ssrn.4471248>
- Prabjit, C. V. S., Kusumawardhani, A., & Gunadi, W. (2021). [Article title missing]. *Budapest International Research and Critics Institute (BIRCI) Journal*, 4(4), 10868–10882.
- Rangaswamy, A., Moch, N., Felten, C., van Bruggen, G., Wieringa, J. E., & Wirtz, J. (2020). The role of marketing in digital business platforms. *Journal of Interactive Marketing*, 51, 72–90.
- Shahid, M. Z., & Li, G. (2019). Impact of artificial intelligence in marketing: A perspective of marketing professionals of Pakistan. *Global Journal of Management and Business Research*.
- Shen, L., et al. (2022). Accelerated and personalized therapy for heart failure with reduced ejection fraction. *European Heart Journal*, 43(27), 2573–2587. <https://doi.org/10.1093/eurheartj/ehac210>
- Storbacka, K., & Moser, T. (2020). The changing role of marketing: Transformed propositions, processes and partnerships. *AMS Review*, 10, 299–310. <https://doi.org/10.1007/s13162-020-00179-4>
- Thaichon, P., Quach, S., Barari, M., & Nguyen, M. (2022). Exploring the role of omni-channel retailing technologies: Empirical insights and future

research directions. SSRN *Electronic Journal*.
<https://doi.org/10.2139/ssrn.4117220>

Varadarajan, R. (2019). Theoretical underpinnings of research in strategic marketing: A commentary. *Journal of the Academy of Marketing Science*, 47, 30–36. <https://doi.org/10.1007/s11747-018-0612-7>