

Marketing

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Impact of generative artificial intelligence on the effectiveness of hyperpersonalization of visual content in contemporary marketing strategies

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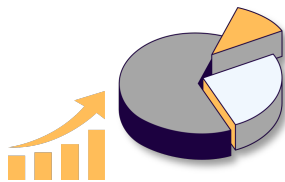
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Abstract. The rapid pace of development of digital technologies and the growing role of data-driven decision-making underscore the relevance of studying the impact of generative artificial intelligence on the effectiveness of hyperpersonalized visual content in modern marketing strategies. The purpose of the article is to substantiate the theoretical foundations and identify the features of the application of generative artificial intelligence to increase the effectiveness of hyperpersonalized visual communication in the modern marketing space. **Methods** used in the work: analysis of scientific literature – to study the current state of research on the issue; generalization and systematization – for a structured and complete presentation of the research results. **Results.** It is established that integrating generative artificial intelligence into marketing processes significantly increases the adaptability, scalability, and contextual relevance of visual content, thereby improving user engagement and conversion indicators. The technological principles and practical mechanisms for implementing generative models in



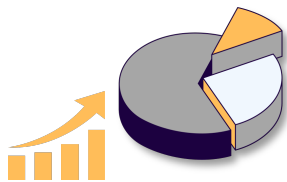
marketing systems are considered, in particular, their role in automating content production and ensuring real-time personalization. It is emphasised that, despite significant advantages, the use of generative artificial intelligence is associated with several challenges, including reliance on data quality, ethical risks, transparency issues, and the potential impact of excessive personalization on consumer perception. The **conclusions** emphasize that generative artificial intelligence is a key driver of transformations in modern marketing, contributing to the transition to predictive and adaptive communication models, and that its effective application requires a balanced combination of technological innovations, ethical responsibility, and the strategic management of personalized content. Further scientific research should be directed toward developing methodological tools to assess the long-term effectiveness of artificial intelligence in hyperpersonalization processes, as well as toward an in-depth study of the ethical challenges and consequences of its use.

Keywords: digital marketing, visual communication, generative AI models, recommendation algorithms, content automation.

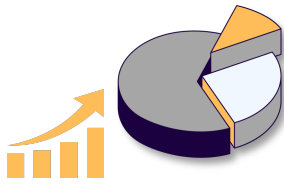
**Вплив генеративного штучного інтелекту на ефективність
гіперперсоналізації візуального контенту в стратегіях сучасного
маркетингу**

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Анотація. Швидкі темпи розвитку цифрових технологій та зростання ролі прийняття рішень на основі даних зумовлюють актуальність дослідження впливу генеративного штучного інтелекту на ефективність гіперперсоналізації візуального контенту в сучасних маркетингових стратегіях. **Метою** статті є



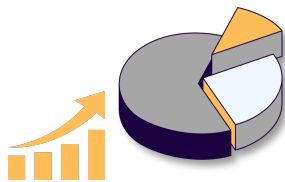
обґрунтування теоретичних засад та виявлення особливостей застосування генеративного штучного інтелекту для підвищення ефективності гіперперсоналізованої візуальної комунікації в сучасному маркетинговому просторі. **Методи**, застосовані в роботі: аналіз наукової літератури – для вивчення поточного стану досліджень із проблематики; узагальнення та систематизація – для структурованого та повного представлення результатів дослідження. **Результати**. Встановлено, що інтеграція генеративного штучного інтелекту в маркетингові процеси значно підвищує адаптивність, масштабованість і контекстну відповідність візуального контенту, сприяючи тим самим покращенню показників залучення користувачів та конверсії. Розглянуто технологічні засади та практичні механізми впровадження генеративних моделей у маркетингові системи, зокрема їхню роль в автоматизації виробництва контенту та забезпеченні персоналізації в режимі реального часу. Наголошено, що, попри значні переваги, використання генеративного штучного інтелекту пов'язане з низкою таких викликів, як залежність від якості даних, етичні ризики, питання прозорості та потенційний вплив надмірної персоналізації на споживче сприйняття. **У висновках** підкреслено, що генеративний штучний інтелект виступає ключовим драйвером трансформацій у сучасному маркетингу, сприяючи переходу до прогнозних та адаптивних моделей комунікації, а його ефективне застосування вимагає збалансованого поєднання технологічних інновацій, етичної відповідальності та стратегічного управління персоналізованим контентом. Подальші наукові дослідження доцільно спрямувати на формування методичних інструментів оцінювання довгострокової ефективності застосування штучного інтелекту в процесах гіперперсоналізації, а також на поглиблене вивчення етичних викликів і наслідків його використання.



Ключові слова: цифровий маркетинг, візуальна комунікація, генеративні моделі ШІ, алгоритми рекомендацій, автоматизація контенту.

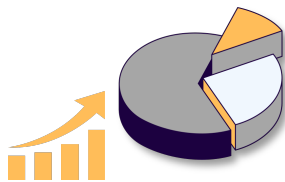
Problem statement. The modern marketing environment is undergoing profound transformations driven by rapid digitalization, expanding data ecosystems, and the growing demand for personalized consumer experiences, leading to the widespread adoption of hyper-personalization as a strategic priority. At the same time, the growing dominance of visual communication on digital platforms is increasing the need for highly adaptive and context-sensitive visual content that can attract attention and influence user behavior in real time. Traditional methods of content creation and personalization are becoming increasingly limited due to low scalability, high resource requirements, and the inability to dynamically respond to constantly changing consumer preferences. In this context, generative artificial intelligence (generative AI) appears as a promising technological solution that allows automating the production of visual content adapted to the individual needs of users; however, the theoretical foundations and practical consequences of its application in the field of hyperpersonalization remain insufficiently systematized within the framework of scientific research.

The study's relevance stems from the need for a more thorough examination of the role of generative AI in enhancing the effectiveness of hyperpersonalized visual communication, particularly amid growing competition for consumer attention and the complexity of digital marketing strategies. Despite the active implementation of AI technologies in marketing practice, there is still a lack of a comprehensive approach to their impact on key performance indicators, user engagement and the overall quality of personalized content. Also, unresolved issues related to data dependence, ethical considerations, algorithmic transparency and the risk of excessive personalization require a more systematic and critical analysis of this phenomenon. Solving these problems is important for developing effective,



sustainable, and responsible marketing strategies that leverage the potential of generative AI while maintaining a balance between technological innovation and consumer trust.

Analysis of recent research and publications. The research issues are addressed in many works by leading domestic scientists. In particular, in the work of S. Kobernyuk, A. Strungar, and L. Zavgorodnia [1], the increase in the effectiveness of personalized advertising is justified by the use of AI algorithms that provide more accurate audience segmentation and real-time content adaptation. In the study by H. A. Zaiachkovska [2], attention is focused on expanding enterprises' marketing capabilities through the integration of intelligent solutions, thereby increasing the relevance of visual messages to consumers. Scientists such as I. R. Losheniuk, V. V. Riabokon, and D. Ya. Kovalenko-Savchuk [3] demonstrate that the use of AI in personalizing marketing strategies increases conversion rates and audience engagement. The work of O. Ryzhko, T. Krainikova, and E. Krainikov [4] considers practical applications of smart algorithms in the advertising industry and demonstrates the effectiveness of generative technologies in creating adaptive visual content. The work of V. Bondarenko and O. Omelianenko [5] analyzes the impact of AI on Internet marketing, emphasizing its role in improving targeting accuracy and automating content creation. The study by O. V. Bulakh [6] highlights the global impact of AI and machine learning on e-commerce, particularly in the context of personalized recommendations and product visualization. The work of A. O. Krymska, U. O. Balyk, and I. O. Klimova [7] considers the digital transformation of marketing, focusing on the implementation of intelligent systems to create individualized content. Strategic models of consumer value management, where hyperpersonalization is a key factor in business competitiveness, are substantiated by M. Traverse, Y. Samoilyk, and I. Zavaliy [8]. A. Humeniuk's study [9] determined that digital marketing using intelligent systems is becoming a defining direction of business development due to the possibilities of deep analysis

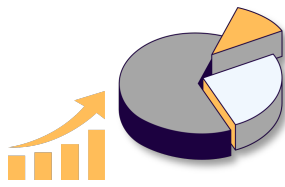


of consumer behavior. At the same time, S. Tkachuk [10] emphasizes the importance of combining copywriting and visualization in social marketing, which, in the context of integrating generative AI, opens new opportunities to create emotionally relevant and personalized content.

Highlighting previously unresolved parts of the general problem. Despite active coverage in scientific literature of the issues of digitalization of marketing, personalization of communications, and the implementation of AI in business processes, modern research is dominated by a general theoretical and applied analysis of the problem, with little emphasis on generative models as tools for creating visual, hyperpersonalized content. The mechanisms for integrating generative AI into the strategic marketing cycle are not sufficiently systematized, from data analytics to the automated production and real-time testing of creatives. The issue of quantitatively measuring the effectiveness of hyperpersonalized visual content generated by generative algorithms, compared with traditional digital tools, remains insufficiently researched. The relationship between the level of personalization of visual messages and consumers' behavioral responses across various digital environments, particularly marketplaces and social networks, needs clarification. The ethical and strategic aspects of using generative AI in forming long-term audience loyalty are also considered in fragments.

Formulation of the article's goals (task statement). The purpose of the article is to substantiate the theoretical foundations and identify the features of using generative AI to enhance the effectiveness of hyperpersonalized visual communication in modern marketing.

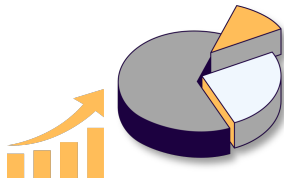
In accordance with the goal, the following tasks were set: to reveal the theoretical essence and evolution of hyperpersonalization in modern marketing; to analyze the technological foundations and principles of functioning of generative AI in creating visual content; to determine the features of integrating generative AI into hyperpersonalization marketing strategies; to assess the effectiveness of its



application and outline the key advantages and challenges of use in the modern marketing space.

Presentation of the main research material. The rapid digitalization of economic and communication processes has fundamentally transformed the logic of interaction between brands and consumers, leading to the emergence of hyperpersonalization as a leading concept in modern marketing [8]. Hyperpersonalization represents a new stage in the evolution of individualization, characterized by the use of real-time data, AI, and predictive analytics to provide content, products, and experiences tailored to individual users. Unlike traditional segmentation approaches, which are based on general audience categories, hyperpersonalization operates at the individual level, accounting for behavioral patterns, contextual factors, preferences, and even emotional reactions. Its development is inextricably linked to the expansion of digital ecosystems, the proliferation of user data, and the growing consumer expectations for relevant and meaningful interactions with brands. Over time, marketing strategies have evolved from mass communication to targeted messaging and, ultimately, to dynamic and adaptive content creation, where each interaction has a unique configuration [9, p. 51–52].

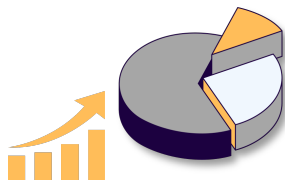
Within the framework of hyperpersonalization, visual content has become a key element of marketing communications, serving not only to attract attention but also as a powerful tool for shaping consumer perceptions, engagement, and decision-making. The rise in the popularity of visual platforms and formats, including social networks, video-sharing services, and interactive interfaces, has heightened the importance of images, videos, and graphics in conveying brand messages. In this context, visual content is processed by the human mind faster than textual content, thereby increasing its effectiveness in engaging users in a competitive digital environment. The emotional and cognitive impact of visual content allows brands to connect with consumers more deeply, making visual communication a key driver of



engagement and conversion. In the context of hyper-personalization, visual content is no longer static or one-size-fits-all; instead, it dynamically adapts to reflect the individual characteristics of each user, including demographic attributes, viewing history, location, and real-time behavior [10].

The effectiveness of hyper-personalized visual content is largely determined by the availability and rational use of data and analytics. Data is the primary resource for identifying user preferences and predicting future behavior, while analytics provides tools and methodologies for transforming raw data into actionable insights. The integration of big data technologies, machine learning algorithms, and real-time processing systems enables marketers to continuously refine content strategies and optimize communication outcomes. Behavioral data, transaction records, social media interactions, and situational signals together contribute to detailed user profiles that serve as the basis for personalized content. Advanced analytical models provide not only descriptive and diagnostic analysis, but also predictive and recommendatory capabilities, supporting proactive decision-making in marketing strategies [11].

It should be noted that generative AI emerged as a transformative technological concept that enables the automated creation of new visual content based on learned patterns from large datasets. Unlike traditional algorithmic systems that operate according to predefined rules, generative algorithms rely on probabilistic modeling and deep learning architectures that can create new datasets that resemble, but do not repeat, the original training data. Generative AI is based on neural network models designed to study complex data distributions, in particular, generative neural networks (Generative Adversarial Networks, GANs), variational autoencoders, and diffusion models. These models operate through cyclic optimization processes, gradually improving their results by minimizing the differences between generated and real data. For example, GANs operate through a dual network structure consisting of a generator and a classifier that engage in



competitive interaction, while diffusion models sequentially transform random noise into consistent images through successive denoising steps. Such mechanisms allow for the generation of high-quality, contextually relevant visual results that can be adapted to various creative and commercial needs [12, p. 217–218].

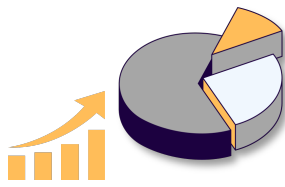
The development of image-generation technologies has significantly expanded the possibilities for creating visual content in the marketing environment. These technologies generate images from text descriptions, stylistic references, or multimodal input data, facilitating the development of personalized visual products without traditional design processes. In marketing practice, generative AI is increasingly used to create advertising visuals, product mockups, social network content, and personalized branding elements. Integrating these technologies into marketing workflows helps companies respond more effectively to changing consumer preferences, accelerate content production cycles, and experiment with a wide range of creative variations. In addition, generation systems support the localization and cultural adaptation of visual materials, allowing brands to tailor their communication strategies to specific audiences across different regions and conditions.

A comparative overview of the practical implementation of key technologies for shaping companies' images is presented in Table 1.

Table 1

Image generation technologies and examples of their use

Technology	Principle of operation	Examples of application in marketing
Generative neural networks	Two neural networks (generator and discriminator) compete to create realistic images	Creating photorealistic images of products and advertising visual effects
Variational autoencoders	Encoding and decoding data into latent representations for controlled generation	Creating stylized brand images and concept visualizations

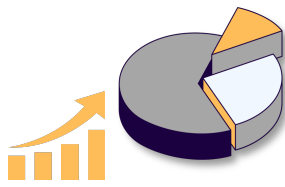


Technology	Principle of operation	Examples of application in marketing
Diffusion models	Gradual transformation of noise into images through an iterative denoising procedure	Generating text into images for personalized advertising content
Transformer models	Using attention mechanisms to generate images from text descriptions	Automated creation of visualizations for social networks and illustrations for campaigns
Style transfer algorithms	Transferring artistic style from one image to another	Adapting brand visualizations to different aesthetic styles and audiences

Source: compiled by the author based on [12; 13]

The examples illustrate the evolution of visual content creation tools, each offering varying levels of control, realism, and creativity in images. The trend toward combining generative models with text descriptions is particularly notable, opening up opportunities for large-scale hyperpersonalization of advertising materials. The use of such technologies in marketing allows not only to automate content creation but also to increase its relevance based on the individual characteristics of the audience. As a result, a new paradigm of visual communication is emerging, where the speed of generation, adaptability, and creativity are key competitive advantages for businesses. The application of these technologies in the marketing environment creates new opportunities that accelerate the widespread adoption of generative AI.

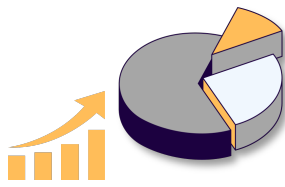
A key advantage is a significant reduction in the time and costs associated with content production, as automated systems can generate large volumes of visual materials with minimal human involvement. At the same time, generative AI enables rapid exploration of multiple design alternatives, fostering innovation in visual communication strategies. The scalability of these technologies allows organizations to maintain a consistent brand identity while adapting content to different audience segments.



In addition to scalability, generative systems also facilitate real-time content creation, which is crucial in a dynamic digital environment where timely, relevant communication is essential. Despite these advantages, the use of generative AI in visual content creation is associated with several limitations and challenges that warrant careful consideration. One of the main concerns is the potential lack of originality, as the generated results are inherently derived from existing data patterns and may unintentionally reproduce biases or stylistic patterns present in the training dataset. This raises questions about intellectual property, authorship, and the ethical use of the generated content. Another limitation concerns the robustness and controllability of generative models, as achieving an accurate match between intended and actual results can require significant computational resources and constant iterative refinement. There are also risks associated with the misuse of generative technologies, including the creation of false or misleading visuals that can reduce consumer trust in a brand. Technical limitations, such as high computational requirements and specialized expertise requirements, also hinder mass adoption, especially for smaller organizations [14].

Generative AI is thus a powerful tool and at the same time a new challenge for modern marketing practices. Its ability to automate and improve the creation of visual content provides significant strategic advantages, but its effective use requires a balanced approach that considers technological capabilities, ethical implications, and the impact on communication processes.

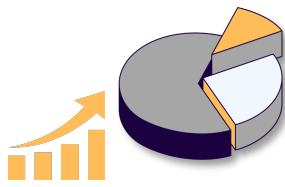
The introduction of generative AI into marketing ecosystems has significantly enhanced the effectiveness of hyper-personalization, especially in visual content. The effectiveness of hyper-personalized visual communication is typically measured using a combination of quantitative and qualitative metrics that reflect user engagement, behavioral response, and overall business results. Among the most commonly used key metrics are click-through rate, conversion rate, time on site, engagement depth, and customer retention. These metrics help gauge how closely



content aligns with individual user expectations. Modern approaches to assessing the effectiveness of hyper-personalized visual communication use predictive analytics and attribution modeling to determine the causal impact of personalized visual elements on consumer decision-making. The integration of real-time feedback mechanisms further enhances the accuracy of such assessments, allowing marketers to continuously improve content based on user response. As a result, hyper-personalized visual content created with AI has greater relevance and contextual relevance, which directly increases communication efficiency and the profitability of marketing investments [15, p. 219].

The implementation of generative AI in marketing strategies is a complex and multifaceted process that involves both technological adaptation and organizational transformation of companies' marketing. In practice, this integration is realized by integrating generative models into the content management system, customer data platform, and digital advertising infrastructure. This combination enables automated generation and real-time active modification of visual content based on individual user profiles and contextual signals. For example, marketing systems can generate personalized product images, adaptive advertising banners, and individualized email graphics that reflect the preferences, behavior, and demographics of specific consumers. This method not only increases the scalability of personalized communication but also ensures consistency across different digital touchpoints. At the same time, the successful implementation of generative AI requires the coordination of data pipelines, computing resources and creative workflows, as well as the development of new competencies in marketing teams [16].

Table 2 provides a systematic overview of practical aspects of incorporating generative models into marketing strategies. The application of these practices creates a more adaptive and flexible marketing space, where communication strategies are continually optimized through feedback loops and data-driven insights. The implementation of generative AI in the marketing infrastructure marks



a transition from reactive to proactive personalization, in which content not only adapts to current user behavior but also predicts future needs and preferences. This predictive ability increases the strategic value of hyperpersonalization, enabling companies to engage consumers earlier in the decision-making process and more effectively influence their development trajectories [18, p. 757–759].

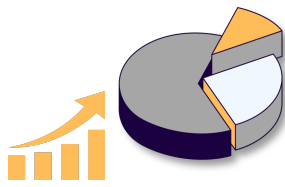
Table 2

Practical aspects of integrating generative artificial intelligence into marketing strategies

Scope of application	Practical implementation	Marketing use case
Personalized advertising	Automated generation of adaptive visual advertising	Dynamic banners adapted to user interests in real time
Email marketing	Creating individualized visual elements in email newsletters	Unique product images based on previous purchases
E-commerce platforms	Generating visual images of products and recommendations	Customized product displays depending on user behavior
Social media marketing	Automated creation of visual content for different audience segments	Personalized posts adapted to demographic and cultural characteristics
Content marketing	Creating visual materials for blogs, landing pages and campaigns	Adaptive illustrations that match user intent and search intent behavior

Source: compiled by the author based on [15–17]

At the same time, the implementation of generative AI in hyperpersonalization is associated with several challenges that may affect its long-term effectiveness and sustainability. One of the main challenges is the complexity of integrating diverse data sources and ensuring their quality, consistency and compatibility. Inaccurate or incomplete data can significantly undermine the effectiveness of personalized content and yield suboptimal marketing results. In addition, reliance on algorithmic decision-making creates risks related to transparency and accountability, as the processes underlying content creation are not always fully interpretable. Ethical issues also play an important role, especially

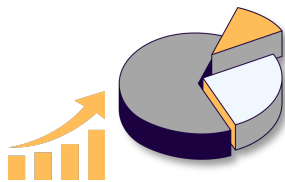


regarding data privacy, informed consent for their processing, and the potential for manipulative practices with data. It is also not worth ignoring the risk of excessive personalization, which can lead to user discomfort or a decrease in perceived authenticity, and this must be taken into account when creating content.

Conclusions. Thus, the study's results confirm that the transformation of modern marketing approaches is closely related to the transition to hyperpersonalized communication models, in which visual content plays a decisive role in shaping consumer engagement and behavioral responses. It is shown that hyperpersonalization is evolving from traditional segmentation approaches toward dynamic, data-driven interaction systems. In this context, generative AI is a technology that significantly expands the possibilities for creating adaptive, contextually relevant visual content. It is shown that modern generative models not only automate content creation processes but also offer a variety of visual solutions tailored to individual user preferences, increasing the flexibility and scalability of marketing strategies. At the same time, integrating generative AI into marketing processes requires coordinating data, analytical tools, and creative approaches, which together determine the effectiveness of its practical application.

The use of generative AI increases the effectiveness of hyper-personalized visual communication, as evidenced by growth in engagement, conversion, and user experience quality indicators. At the same time, a number of significant challenges to its integration have been identified, in particular: dependence on data quality, risks of algorithmic bias, problems of transparency and interpretability of decisions, as well as ethical aspects related to the protection of personal data and the risks of excessive personalization. This necessitates a balanced approach to implementing generative technologies in marketing strategies, combining technological innovations with principles of consumer responsibility.

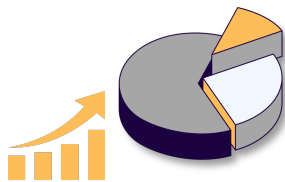
Therefore, generative AI should be considered not only as a tool to enhance the effectiveness of marketing activities, but also as a complex socio-technological



phenomenon that requires systematic management and ongoing evaluation. Prospects for further scientific research lie in developing methodological approaches to assessing the long-term effectiveness of using generative AI in hyperpersonalization and studying the ethical aspects of its implementation.

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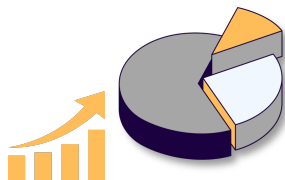
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