

ARTIFICIAL INTELLIGENCE TOOLS USED FOR GRAPHIC CONTENT GENERATION

Andreea BARBU

National University of Science and Technology Politehnica Bucharest, Bucharest, Romania

ORCID ID: <https://orcid.org/0000-0003-3119-8753>

*Corresponding author, andreea.barbu2901@upb.ro

Maria Elena TACHE

Graffiti 94 R.B.I. PRODCOM SRL, Bucharest, Romania

ORCID ID: <https://orcid.org/0009-0004-9783-8551>

maria.tache05@gmail.com

Sandra Samy George HADDAD

Arab Academy for Science, Technology, and Maritime Transport, College of International Transport and Logistics, Alamein, Egypt

ORCID ID: <https://orcid.org/0000-0002-8736-1364>

sandra.haddad@aast.edu

Jilan KESHTA

Arab Academy for Science, Technology, and Maritime Transport, College of International Transport and Logistics, Alexandria, Egypt

ORCID ID: <https://orcid.org/0000-0001-7761-413X>

Jilan9a@aast.edu

Abstract. Regardless of the industries, a basic component that we find everywhere lately in the context of marketing and promotion, is the result of artificial intelligence, whether we are referring to written content, visual content, videos or a combination of them. As social media remains one of the basic channels for promoting companies, the visual content posted must also be of quality. In this context, it is difficult for companies to invest from the beginning in a solution that will ensure the maximization of the effects of artificial intelligence on posts. Thus, this paper aims to help the industry wishing to apply solutions based on artificial intelligence to generate visual content with concrete suggestions regarding the use of certain tools of interest. The paper presents the comparative analysis of 5 such tools, which are compared based on clear evaluation criteria. Through the results of the study, the authors suggest the NightCafe solution as one of the most suitable for a company that wants to generate visual content with the help of artificial intelligence, this result being based on the detailed comparative analysis presented in this study.

Keywords: artificial intelligence tools, graphic image generation, graphic content generation, graphic design, digital marketing

How to cite: BARBU, A., TACHE, M. E., HADDAD, S. S. G., & KESHTA, J. Artificial Intelligence Tools Used for Graphic Content Generation. *International Conference of Management and Industrial Engineering*, 12. <https://doi.org/10.56177/12icmie2025.140>

Introduction

In a context where artificial intelligence is developing every moment, "text-to-image" tools have begun to become an important topic of research and innovation, attracting attention both for their creative potential and for their impact on various fields, including business. At the end of the year 2024, a simple search in the Clarivate database using the keywords "Text-to-image Tools" AND "AI" yielded 64 results, which highlight the existence of two major themes – the general applicability in creative processes (including architectural design) and the importance prompt optimization tools. Midjourney appears as an isolated landmark, emphasizing its specific relevance and popularity (Fig.1).

The first noticeable cluster is the one oriented towards Architectural Design and Artificial Intelligence, suggesting a practical applicability of these tools in professional fields, not just in art or entertainment. A second cluster that can be observed is the one based on Creativity and Generative AI, which seems to be mainly oriented to ideas related to creativity, generative artificial intelligence and methods for optimizing text commands (prompt engineering).

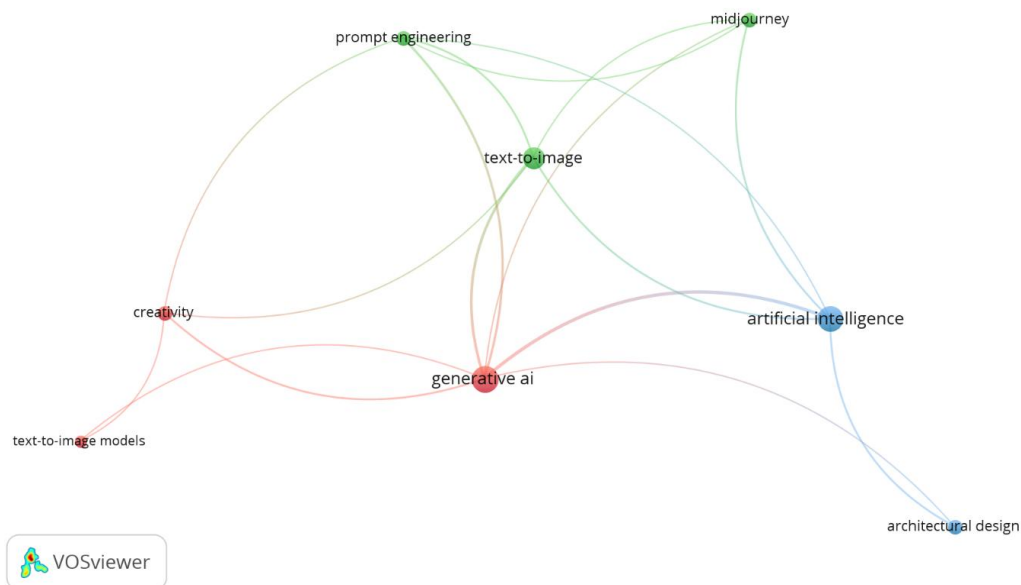


Figure 1: The analysis of key word co-occurrence on Text-to-image Tools and AI
Source: Author's own contribution

This cluster suggests that recent trends focus on the development and use of generative AI to enhance creative processes and personalize results through effective prompts. Additionally, the cluster may suggest a strong link between creativity and generative AI technology, highlighting how important it is for users to optimize prompts to achieve better results. Another cluster with a single main element is related to Midjourney, a popular imaging tool. According to this analysis, it can be concluded that this application is very popular, being considered in this context a reference tool in the field. Midjourney may be recognized for specific features or a strong user base, so it appears as an isolated cluster.

Although it appears as a central element, Midjourney is not the only tool used on the market. Thus, the purpose of this paper is to conduct a comparative analysis between 5 such tools and to discover if this presented solution is indeed the most useful from an objective point of view.

Literature review

Marketing and artificial intelligence (AI) are well-known necessities that have grown in prominence over the last ten years [1]. The development and use of AI in marketing has piqued the interest of many businesses as well as the interest of many researchers.

After analyzing 217 papers on the role of AI in marketing, Haleem et al. [2] identified 23 different directions of how AI affects digital marketing within companies. According to them, AI allows companies to understand consumer behavior and effectively target audiences helping marketers deliver personalized messages at the right time. This automates processes and reduces human errors, allowing marketers to improve customer support and provide a better and more convenient experience [3]. AI connects business processes, rapidly analyzing large volumes of data to provide valuable information and insights about consumer preferences [4]. At the same time, AI eases workload and enables data-driven decisions, helping to optimize inventory and personalized buying processes [5]. Through effective digital advertising, AI supports increased customer satisfaction and revenue, behavior prediction, and adaptation to audience needs [6]. Moreover, AI analyzes data to improve communication and predictability of requirements, helping businesses achieve their strategic goals and provide a unique customer experience.

In this context, generative artificial intelligence (GAI) also appears, which can produce unique digital content, depending on the requests entered by the user [7]. Through GAI, users can mention in the AI tool what kind of result they want to be generated, whether it is an email, a synthesis or even a visual sketch of a table or even representative images. Thus, the results generated by GAI can be text (such as ChatGPT), images (such as Midjourney), animations or videos (such as (Steve AI), or even music (such as Boomy) [8]. These tools started to become more and more popular among users, being easy to use and with immediate results, customized according to the wishes and specifications entered by the user. Although in searches of specialized literature, Midjourney appears as a popular basic tool in terms of Text to image tools solutions, this is not the only platform that can help users obtain images in different fields

according to existing needs. McLean [9] presents 11 Best AI Text-to-Image Tools in 2024, in its top Midjourney not occupying the first position. Thus, although Midjourney stands out at first glance as the most popular platform that is analyzed by researchers, the existing offers on the market also indicate other platforms that can be even more useful. In this context, the authors propose to carry out a comparative analysis of 5 such text-to-image tool applications: PhotoSonic, Jasper AI, Midjourney, DALL-E 2, NightCafe, to see which is the most suitable and not necessarily when it comes to the visual results offered. PhotoSonic is a platform that converts words into images and art, it is part of the Writesonic suite of AI tools. Using state-of-the-art AI algorithms, it generates unique images based on specified parameters. Users can quickly and easily create copyright-free images by simply describing what they want to see. This platform offers various AI art modes, facilitating the free flow of users' imagination and creativity [10]. The process begins by entering the desired text into the PhotoSonic interface. The AI model then analyzes the text, extracting key themes, emotions and visuals. These perspectives are applied to create a unique artistic representation that captures the essence of the text. Users can later customize the generated artwork by changing parameters such as colour palette, style and composition.

Jasper AI is an AI art generator that serves as a bridge between technology and creativity, providing users with a platform to bring visual concepts to life. It understands and interprets user requests, turning them into visually stunning works of art. With a strong focus on accessibility, Jasper AI is designed to be easy to use, allowing people with no prior graphic design experience to create professional-level images [11]. Unlike most AI tools that are limited to specific tasks and can provide generic results, Jasper AI can be customized for any brand and can be integrated on any platform, from email to social media to your website [12].

Midjourney is a text-to-image AI program that can create artistic graphics based on user requests. Midjourney helps artists and designers quickly generate ideas and concepts. This can be especially useful for those who do not have a solid background in traditional art techniques but want to express their creative ideas. Midjourney uses advanced machine learning algorithms to analyze the text entered and generate a relevant image. Unlike other platforms that can translate text into images, access to Midjourney is achieved through the online communication platform Discord [13].

DALL-E 3 is an advanced AI system created to generate high-quality images based on textual descriptions. Developed by OpenAI, DALL-E 3 builds on the foundation of its predecessors, providing coherent and contextually accurate images [14]. OpenAI points out that DALL-E 3 demonstrates a deep understanding of context and is notable for its improved accuracy and efficiency in image generation, being built on top of ChatGPT, DALL-E 3 offers the assurance of rapid refinement and effortless image adjustments [15].

NightCafe stands out as one of the top AI art generators, offering a full range of algorithms and options for users who want to create images using artificial intelligence. The NightCafe AI Art generator is easy to use, accessible to everyone regardless of skill level. The intuitive interface allows users to select their preferred settings and generate artwork with just a few clicks. Editing tools give users the ability to further customize their artwork, giving them complete creative control [16].

Methodology

This paper aims to analyze the main 5 Text to image tools used in 2024. In this context, the authors started from the identification of the 5 solutions, based on consulting the ranking made by McLean [9]. Thus, the analysis will include the following solutions: PhotoSonic, Jasper AI, Midjourney, DALL-E 3 and NightCafe. The main objective of this research is focused on the evaluation of the presence of the features of each individual platform. The secondary objectives aim to identify the differences in the functionalities offered by each platform, as well as a ranking based on which the best application will be identified according to the evaluated criteria.

To perform a comparative analysis of these solutions, the authors consulted several platforms, such as those offered by: Techjockey.com [17], Elegantthemes.com [9], Fritz.ai [18], Moringdough.com [11], after which they were able to extract some main evaluation criteria. Among these criteria, we mention: Intuitive interface, acceptance of several work styles, Prompt creation, Customization tools, 100% original content without plagiarism, Plagiarism check, Insert bibliography, Interaction with other creators, Use through the Discord platform, Collaborative creation with friends, Templates, Create video, Share on social networks, Create multiple image variants, Multiple file formats (JPEG, PNG, PDF), Ability to create GIFs, 24/7 technical support, Access to tutorials and Resources, Possibility to customize the interface, Possibility of automatic backup. In addition, for each mentioned platform, the authors created an account for a period of one month, to examine the functionalities and the interaction with these applications. Following our own experience, but also after consulting the platforms mentioned above, a table was created comparing the features of each platform to highlight the similarities and differences between them.

Results and further discussions

First, the authors centralized the main basic features of the 5 AI platforms. According to Tab. 1, all 5 applications have the same characteristics in terms of supported platforms, devices, implementation, business specifics and AI features. The notable differences are when it comes to free trials and monthly subscriptions. The platform that offers the longest free period is Jasper AI, 7 days, which is also the platform that has the highest monthly cost, at \$49, while the cheapest application for generating images through artificial intelligence is Night Cafe for only \$5.99 and 10 free creations.

Table 1: The basic features of the image generating platforms analyzed in this paper

Features	PhotoSonic	Jasper AI	Midjourney	DALL-E 3	NightCafe
Supported platforms	Ubuntu, Windows, MacOS, Linux				
Device	Desktop, Mobile, Tablet, iPad				
Implementation	Web based				
Suitable for	All industries	All industries	Photography, Games	All industries	All industries
Business specific	All industries				
Company size	SB, S, MB, E, SMEs	SB, S, MB, E, SMEs	SB, S, MB	SB, S, MB, E.	SB, S, MB, E
Customer relations	Support center	E-mail	E-mail, Communities	E-mail	E-mail
AI Features	Integrated AI				
Free trial	One time for advanced templates	7 days	It doesn't exist	2 creations	10 creations
Subscription per month	19.00 \$	49.00 \$	10.00 \$	20.00 \$	5.99 \$

Note: SB- Small Businesses, S- Startups, MB- Medium Businesses, E-Enterprises, SMEs- Small and Medium-Sized Enterprises

Source: adapted from Techjockey.com: Compare Midjourney VS NightCafe AI VS Jasper ai VS Writesonic, Available from <https://www.techjockey.com/compare/midjourney-vs-nightcafe-vs-jarvisai-vs-writesonic> Accessed: 2024-12-14

Also, the authors made a comparison between the 5 analyzed applications that create images using AI (Tab. 2).

Table 2: Comparison between the 5 analyzed solutions that create images using AI

Features	PhotoSonic	Jasper AI	Midjourney	DALL-E 3	NightCafe
Intuitive interface	√	√	X	√	√
Various styles	-	√	√	-	-
Prompt creation	√	√	√	√	√
Personalization tools	-	√	√	-	√
100% original content without plagiarism	X	√	X	X	-
Plagiarism check	√	X	X	X	-
Insert bibliography	√	X	X	X	-
Interaction with other creators	X	X	√	√	√
Use through the Discord platform	X	X	√	X	X
Co-creation with friends	-	-	-	√	√
Template	√	√	√	√	√
Video creation	-	-	-	√	√
Sharing on social networks	√	-	-	√	√
Create multiple image variants	√	√	√	√	√
Multiple file formats (JPEG, PNG, PDF)	√	√	√	√	X
Ability to create GIFs	-	-	-	√	√
Technical support available 24/7	√	√	√	√	√
Access to tutorials and resources	√	√	√	√	√
Possibility to customize the interface	√	-	-	-	√
Possibility of automatic backup	√	√	-	√	√
TOTAL	12	11	10	13	14

Note: √: is present in the platform; X; is not present in the form;-: could not be identified

Source: Authors' own research

Moreover, the authors awarded one point for each criterion fulfilled by the application, at the end calculating a score that reflects the number of characteristics fulfilled by each solution. Thus, based on these, a ranking was made to identify the application that fulfils the most requirements (Tab. 2). According to the analysis carried out, NightCafe stands out as the leader, obtaining the highest total score, 14 points. This is due to a wide range of features such as intuitive interface, prompt creation, customization tools, text-to-design translation, collaborative creation with friends, sharing on social networks, creating multiple image variants, multiple file formats and technical support available 24/7.

DALL-E 3 ranks second with a score of 13 points. Offering a wide range of functionality, including intuitive interface, prompt creation, the ability to create multiple image variants and 24/7 technical support, DALL-E 3 differentiates itself from the third place PhotoSonic by 12 points, with the possibility the creation of GIFs, but also video images, while PhotoSonic offers functionalities such as inserting the bibliography and the possibility of customizing the interface.

On the other hand, in fourth place is Jasper AI with 11 points and one point behind last place Midjourney. These platforms share the same features in terms of style diversity, prompt creation, customization tools, presence of templates, access to tutorials and resources, but differ in other aspects, such as presenting 100% original content in the case of the Jasper AI platform, instead what Midjourney offers is the interaction with other creators and access to the text image generation platform is done with the help of the Discord network.

Overall, NightCafe seems to be the most complete option, offering a wide range of features, including interaction with other creators, collaborative creation, and social sharing.

The results of this research can be useful both for marketing practitioners and theorists, the comparative analysis made by the authors having both theoretical and practical implications. From a theoretical point of view, the ranking and differences between the analyzed platforms can represent an important starting step in order to provide a framework for research in generative AI and for the development of theories regarding the performance and applicability of these technologies. Afterwards, different research can be carried out related to the identification of the functionalities presented that can contribute to the realization of a more performing platform, and based on them, new theoretical models related to the efficiency of image generation can be proposed. In addition, if we refer to the marketing context, these results can represent the starting point for conducting theoretical studies on how generative AI influences consumer perceptions and the effectiveness of visual content. In this sense, solutions such as NightCafe and DALL-E 3, which prioritize customization and rapid generation functionality, can be studied to understand if and how consumer preferences can be influenced towards automatically generated versus manually created content [19].

From a practical point of view, the results of this study can have implications for improving the cost-efficiency ratio in the creation of marketing content. For example, marketing teams can use platforms with fast generation and intuitive interfaces like NightCafe and DALL-E 3 to create quality visual content in a very short time [20]. This allows marketers to maintain a constant flow of new, responsive content, which is important for social media and advertising campaigns where the refresh rate must be high. Practitioners can thus achieve a good cost-effectiveness ratio, reducing the resources allocated to traditional graphic design and saving time by automatically generating images. Also, platforms with advanced customization capabilities, such as PhotoSonic and Jasper AI, can be used to tailor the style and visual message according to brand identity, creating visual consistency across all marketing materials [21]. This personalization helps reinforce brand image and create a genuine connection with the target audience. Likewise, solutions with collaboration and sharing functionality (e.g. NightCafe and Midjourney) can facilitate interaction between marketing teams and help create interactive campaigns where consumers can interact with the brand in new ways. This helps increase engagement and achieve organic distribution of AI-generated content [22].

Moreover, when it comes to the implications of this research at the level of research and education in the field of AI, we could say that this ranking obtained, which highlights the main characteristics of each platform, can influence the choice of tools for research or teaching. For example, platforms like NightCafe and DALL-E 3, with intuitive interfaces and 24/7 technical support, could be more attractive to academic institutions teaching or studying generative AI, allowing students to easily explore the underlying concepts [23]. On the other hand, solutions such as Jasper AI and Midjourney (diversity of styles and generation of original content), provide an excellent opportunity for students in creative fields (like arts, design, architecture) to experiment with and explore new visual styles and techniques of artistic expression based on AI. In addition, the results of this research can also have an effect in the academic environment, where AI platforms can be used to create simulations of visual campaigns and to test various approaches before actual implementation. Thus, starting from the use of the most appropriate solutions depending on the context, researchers and students would be allowed to validate visual marketing theories and better understand the impact of the image on consumer behavior.

Conclusion

Through this paper, the authors analyzed 5 text-to-image AI tools: PhotoSonic, Jasper AI, Midjourney, DALL-E 2, NightCafe. The results of the research highlighted the fact that although in the literature, Midjourney is the most popular application, NightCafe is the most complete option for users who want a wide range of functionalities. In the context of marketing, the analysis highlights that NightCafe can be an optimal choice for marketing teams who want a complete tool for creating, distributing and personalizing visual content. DALL-E 3 and PhotoSonic stand out for their ease of use and varied formats, which can make them useful in social media and content marketing campaigns. Jasper AI and Midjourney are also good options for personalization and interaction, suitable for teams that want to explore the creativity of AI in marketing and learn how to use these tools to create a memorable brand identity. Thus, each platform brings theoretical and practical advantages in the context of marketing, from rapid content creation to collaboration and personalization, allowing marketing teams to become more efficient, more innovative and better adapt to the demands of the digital environment.

References

- [1] Manoharan, G., Durai, S., Ashtikar, S. P., & Kumari, N.: Artificial Intelligence in Marketing Applications, In *Artificial Intelligence for Business*, Productivity Press, New York, eBook ISBN 9781003358411, (2024), pp. 40-70
- [2] Haleem, A., Javaid, M., Qadri, M.A., Singh, R.P., & Suman, R.: Artificial intelligence (AI) applications for marketing: A literature-based study, *International Journal of Intelligent Networks*, 3(2022), pp.119-132, ISSN 2666-6030
- [3] Buntak, K., Kovačić, M., & Mutavdžija, M.: Application of Artificial Intelligence in the business, *International Journal for Quality Research*, 15(2), (2021), pp. 403-416, ISSN 1800-6450
- [4] Spreitzenbarth, J.M., Stuckenschmidt, H., Bode, C.: The state of artificial intelligence: Procurement versus sales and marketing. In: Bode, C., Bogaschewsky, R., Eßig, M., Lasch, R., Stölzle, W. (eds) *Supply Management Research. Advanced Studies in Supply Management*. Springer Gabler, Wiesbaden. (2022), Online ISBN 978-3-658-38350-3, pp. 173- 193
- [5] Kumar, T. S.: Data mining-based marketing decision support system using hybrid machine learning algorithm, *Journal of Artificial Intelligence*, 2(03),(2020), pp. 185-193, e-ISSN: 2582-2012
- [6] Zhao, H., Lyu, F., and Luo, Y.: Research on the Effect of Online Marketing Based on Multimodel Fusion and Artificial Intelligence in the Context of Big Data, *Security and Communication Networks*, vol. 2022 (2022), Article ID 1516543, 9 pages
- [7] De Cremer, D., Bianzino, N.M. and Falk, B: How generative AI could disrupt creative work, Harvard Business Review, Available from <https://hbr.org/2023/04/how-generative-ai-could-disrupt-creative-work#:~:text=In%20this%20scenario%2C%20generative%20AI,less%20new%20art%20and%20content> Accessed: 2024-12-14
- [8] Wahid, R., Mero, J., & Ritala, P.: Written by ChatGPT, illustrated by Midjourney: generative AI for content marketing, *Asia Pacific Journal of Marketing and Logistics*, 35(8) (2023), pp. 1813-1822, ISSN 1355-5855
- [9] McLean, D.: 11 Best AI Text-to-Image Tools in 2024 (Compared), Available from [https://www.elegantthemes.com/blog/design/best-ai-text-to-image-tools?utm_source=Blog&utm_medium=Pillar%20Posts&utm_campaign=Google%20Search&retargeting=off&gad_source=1&gclid=CjwKCAjwouexBhAuEiwAtW_Zx2KBPn1_-CaaRul3qqYHOiKzV7p7UCpxXhmJdZLrQAdSYb3WYCNH0xoCDcl%20\(Accessed:%2015%20May%202024\).%27](https://www.elegantthemes.com/blog/design/best-ai-text-to-image-tools?utm_source=Blog&utm_medium=Pillar%20Posts&utm_campaign=Google%20Search&retargeting=off&gad_source=1&gclid=CjwKCAjwouexBhAuEiwAtW_Zx2KBPn1_-CaaRul3qqYHOiKzV7p7UCpxXhmJdZLrQAdSYb3WYCNH0xoCDcl%20(Accessed:%2015%20May%202024).%27) Accessed: 2024-12-14
- [10] PhotoSonic: The Most Advanced AI Text to Art Generator (2023). [Online]. Available: <https://photosonic.pro/>
- [11] Paz, I.: Jasper Art, Available from https://www.morningdough.com/ro/ai-tools/jasper-art/#google_vignette Accessed: 2024-12-14
- [12] Jasper.AI: The Jasper AI Image Suite, Available from https://www.jasper.ai/art?from=ads&fp_sid=1-g-Cj0KCCQjwexyxBhC7ARIsAC7dS39Y896c6hyzl2OkjuRTYz-6yI56Adx-XchAzDDiddK6D0tE3ZtrT8aAr11EALw_wcB&gad_source=1 Accessed: 2024-12-14
- [13] Yildirim, E.: Text-to-image generation AI in architecture. In *Art and architecture: Theory, practice and experience*, 97, editor Kozlu, H.H., Livre de Lyon, ISBN 978-2-38236-493-2, Lyon, (2022), pp. 97- 119
- [14] Temsah, M. H., Alhuzaimi, A. N., Almansour, M., Aljamaan, F., Alhasan, K., Batarfi, M. A., ... & Nazer, R.: Art or artifact: evaluating the accuracy, appeal, and educational value of AI-generated imagery in DALL· E 3 for illustrating congenital heart diseases”, *Journal of Medical Systems*, 48(1) (2024), pp. 54-., ISSN 1573-689X
- [15] Pykes, K.: An Introduction to Using DALL-E 3: Tips, Examples, and Features | DataCamp, Available from <https://www.datacamp.com/tutorial/an-introduction-to-dalle3> Accessed: 2024-12-14
- [16] McFarland, A.: NightCafe Review & Tutorial (May 2024), Available from <https://www.unite.ai/nightcafe-review-tutorial/> Accessed: 2024-12-14
- [17] Techjockey.com: Compare Midjourney VS NightCafe AI VS Jasper ai VS Writesonic, Available from <https://www.techjockey.com/compare/midjourney-vs-nightcafe-vs-jarvisai-vs-writesonic> Accessed: 2024-12-14
- [18] Fritz.ai: Fritz™ scans & ranks all AI tools, Available from <https://fritz.ai/> Accessed: 2024-12-14
- [19] Ananthakrishnan, R., & Arunachalam, T.: Comparison Of Consumers Perception Between Human Generated And AI Aided Brand Content, *Webology*, 19(2) (2022), ISSN: 1735-188X
- [20] Zhu, L., Mou, W., Wu, K., Zhang, J., & Luo, P.: Can DALL-E 3 Reliably Generate 12-Lead ECGs and Teaching Illustrations?, *Cureus*, 16(1) (2024), e52748, ISSN 2168-8184
- [21] Huang, M. H., & Rust, R. T.: A strategic framework for artificial intelligence in marketing, *Journal of the Academy of Marketing Science*, 49(1) (2021), pp. 30-50, ISSN 1552-7824
- [22] Sharma, M., Zaman, Z., Painuly, P. K., & Kumar, A. S. (2025). “How Can AI Help Change the Future of Marketing?”. In *AI and Machine Learning Applications in Supply Chains and Marketing*, IGI Global, ISBN 9798369367605, (2025), pp. 163-188
- [23] Farrelly, T., & Baker, N.: Generative artificial intelligence: Implications and considerations for higher education practice, *Education Sciences*, 13(11) (2023), pp. 1109, ISSN: 2227-7102