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THE APPLICATION OF GENERATIVE ARTIFICIAL INTELLIGENCE IN MEDIA AND SOCIAL NETWORKS

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Summary: Information technologies have experienced great progress in recent years, primarily as a result applications of artificial intelligence (AI) and related technologies. This progress is particularly noticeable after the emergence of generative AI (GenAI), which uses advanced algorithms for pattern analysis data and generates data to create different types of new content, including text, images, sounds, videos or program code. Large technology companies, primarily Microsoft, Google or Amazon, use an increasing number of different GenAI applications. The company OpenAI launched is an interactive chatbot ChatGPT in November 2022, the company Microsoft from 2023. uses the Microsoft Copilot chatbot, while the Google Gemini interactive chatbot application is integrated within the Google Workspace environment.
The growth of social media users is increasingly fueled by artificial intelligence, as it enables understanding user behavior through large databases, deep learning (understanding the context of images and videos), deep text (using neural networks, with its own algorithm, to analyze words in user posts to understand their context and meaning), and image and face recognition (recognizing faces based on two or more comparable, different photos).
Artificial intelligence, especially generative, allows media organizations to quickly analyze and predict data in real time, giving them a competitive advantage in innovation, creativity, and adaptation to a dynamic market.

Key words*: generative artificial intelligence, social networks, media organizations*

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ПРИМЕНА ГЕНЕРАТИВНЕ ВЕШТАЧКЕ ИНТЕЛИГЕНЦИЈЕ У МЕДИЈИМА И ДРУШТВЕНИМ МРЕЖАМА

Резиме: Информационе технологије су последњих година доживеле велики напредак, пре свега услед примене вештачке интелигенције (AI) и сродних технологија. Овај напредак је посебно приметан наком појаве генеративне AI (GenAI), која користи напредне алгоритме за анализу образаца података и генерише податке за креирање различитих врста нових садржаја, укључујући текст, слике, звукове, видео записе или програмски код. Велике технолошке компаније, пре свега Microsoft, Google или Amazon, користе све већи број различитих GenAI апликација. Компанија OpenAI покренла је интерактивни четбот ChatGPT у новембру 2022. год, компанија Microsoft од 2023. год. користи Microsoft Copilot, док је Google Gemini интерактивна четбот апликација интегрисана у оквиру Google Workspace окружења.

Пораст корисника друштвених мрежа све више подстиче вештачка интелигенција, јер омогућава разумевање корисничког понашања кроз велике базе података, дубоко учење (разумевање контекста слика и видео записа), дубоки текст (користи неуронске мреже, са сопственим алгоритмом, за анализу речи у објавама корисника како би се разумео њихов контекст и значење) и препознавање слика и лица лица (препознавање лица на основу две или више упоредних, различитих фотографија).

Вештачка интелигенција, посебно генеративна, омогућава медијским организацијама брзу анализу и предикцију података у реалном времену, пружајући им конкурентску предност у иновацијама, креативности и прилагођавању динамичном тржишту.

Кључне речи*: генеративна вештачка интелигенција, друштвене мреже, медијске организације*

1. INTRODUCTION

Similar to other technological watershed moments in human history, generative artificial intelligence (GenAI) has the potential to completely change the way people live, work, and use technology. What makes GenAI such a special technology is the fact that it has the possibility of very wide application, and at the same time, solutions based on it allow users to relatively easily accept, integrate and use them in business environments or for everyday work. Large language

models LLM (Large Language Model), in addition to being able to generate natural language, are able to generate program code, so they are increasingly used for programming, checking or removing program errors (bugs), or for creating documentation or code refactoring.

GenAI has the potential to be applied in numerous areas. It is possible, for example, applied in the computer game industry for video generation (Sora, DeepDream or RunwayML models), for image generation (DALL-E or MidJourney models) or for music generation (MuseNet, WaveNet or Tacotron models). In the field of education and e-learning, GenAI models can be applied as virtual teaching for different fields. The field of finance is also a significant area of application of GenAI, as LLM models can be used in financial forecasting and often achieve better results than financial analysts. The areas of application of GenAI in the media (marketing, journalism, public media ...) or in the area of using social networks are particularly significant. Generating program code is only one of the application areas of GenAI and LLM models, and for that it is not necessary to use e.g. ChatGPT already specialized software such as GitHub Copilot. There are also open source solutions that can be used for free (eg Codeium) that can be used to learn programming where it is possible to generate code, explain the generated code in detail line by line, or find and debug code.

Today, popular LLM chatbot models (chatbots), such as ChatGPT, Copilot, Gemini or Claude, which, in addition to interaction with text, enable the input of documents, images or files, based on which feedback is obtained or further used for continuous dialogue, analysis, etc. All mentioned LLM models have evolved in a short time from standard conversational tools into advanced AI assistants that can increase productivity or help users in different ways.

Modern AI solutions based on GenAI technology are developing at a very fast pace, so it is already certain that they will be implemented in areas where this could not be expected. The world's most famous IT companies were involved in the development of GenAI technology, among which Microsoft is the leader in terms of speed and scope of GenAI integration. In addition to offering the possibility of using the Copilot LLM model for free, which can also use the OpenAI model GPT-5, or generate images using the DALL-E model, there is also the possibility of using the commercial Copilot Pro model, which offers additional integration options in Office 365 applications.

Figure 1. The most popular chatbot language models (ChatGPT, Copilot, Gemini and Claude)

GenAI is currently one of the most innovative technologies, as evidenced by the fact that the company Nvidia, which is the manufacturer of the most popular graphics cards specialized in training AI models, has become one of the most valuable technology companies. The demand for Nvidia hardware is increasing, because the creation and use of AI models use imposing computing resources. It takes thousands of GPUs and a complex network infrastructure to get the desired results.

Despite all the advantages, GenAI technology also has certain disadvantages. In addition to the large costs required to develop the infrastructure to train and use the models, the fact is that all this has a large impact on the energy consumption of large data centers, as well as on ecology and the environment. One of the main problems with GenAI is that the creation and use of AI models requires the collection of large data sets (text, images, video or sound recordings). Some AI companies are already facing lawsuits because they used copyrighted content to train their AI models. Although training the LLM model requires large amounts of data, it is very important not to violate ethical boundaries and to protect intellectual property rights, in which official regulatory bodies must always be involved. The EU has adopted the Artificial Intelligence Act (https://artificialintelligenceact.eu/) which is a legal framework for artificial intelligence, dealing with its risks (privacy issues, copyright and the implications of creating deepfakes and fake news).

Although large language models have advanced significantly, the problems of bringing in wrong data and "making up" facts still exist. The answers obtained from the LLM model should be checked because although they may seem very convincing, they may not always be correct or true. Addressing these issues in AI

models is a significant area of research, and great efforts are being made to overcome them. However, large language models have their limitations that may never be resolved. The OpenAI company currently uses the GPT-5 language model, which is significantly better, faster and more accurate than previous versions, and has the characteristics of an AI agent, which means that it will be able to autonomously perform tasks, make decisions, learn to improve its performance in order to reach the level of general artificial intelligence AGI (Artificial General Intelligence), which is still far from the point of view of today's AI solutions.

The assumptions are that in the coming period there will be an acceptance of reality about the possibilities and shortcomings of GenAI solutions, which will lead to a decline in its application, after which its more specific and directed application should follow. Currently, most of the models are used experimentally or to find the best way to use GenAI as a supplement. Although the available software solutions generally offer similar functionalities and are based on the same language model that they use through specific APIs, the local use of the model is expected, which will enable increasingly advanced computer hardware.

Leading companies are already investing large financial resources in the development of GanAI. Microsoft has so far invested over $13 billion in OpenAI, while Anthropic has invested over $6 billion in the development of the Claude model. According to Gartner estimates, by 2027, more than 50% of GenAI models will be used specifically for a specific area of business or industry, while over 75% of companies will use GenAI to create synthetic data. One of the steps towards advancing GenAI is the introduction of smart agent mechanisms, which will use different AI models and cooperate with each other to perform specific tasks. Also, one of the important factors will be an ethical approach in the development of AI technologies in order to ensure the transparency, fairness and security of their application, which should lead to the creation of more advanced and complex systems that will be able to solve increasingly diverse and complex problems.

2. GENAI - WAY OF FUNCTIONING

GPT (Generative Pretrained Transformer), an LLM language model that was an introduction to GenAI technology, was published in 2017 by Google in their scientific paper "Attention is all you need" (Vaswani, et al., 2017). He represented the so-called transformer architecture, which is based on the deep learning model DL (Deep Learning). The forerunner of this architecture were convolutional neural networks CNN (Convolution Neural Networks), as well as recurrent neural networks RNN (Recurrent Neural Networks). These types of neural networks use large amounts of data for learning or training and have their limitations, the biggest of which is the sequential processing of input data. In the context of natural language processing and sequential processing, the transformer architecture stood out as a significantly better solution, so that today it is the basis of most LLM medels. The Transformer model uses an inference mechanism that allows it to establish direct connections between different parts of the input string, determining the importance and relationships between them (eg dependencies between words in a sentence). This significantly speeds up the process of learning and predicting (prediction) one piece of data with a set of others, by determining their relevance in the current context, and then using the results of the comparison to calculate what the output set of data should be. These comparison and calculation operations represent a series of complex mathematical calculations on the basis of which the most probable output is obtained based on the given input, while a series of complex mathematical calculations are performed in the neural networks themselves.

Although large language models use text strings as input and output, their mechanism of operation is based on the use of tokens, which are the basic units of text (words, Cornish words, words within other words, or letters and characters). After the "tokenization" process, the next step in the operation of a language model is decoding (embedding), which maps strings of tokens into a vector form that contains semantic meaning and their mutual relationships. The neural network uses the formed vectors to generate an output vector that predicts the next token in the string, and then that same token is decoded back into text. As a result of this decoding, natural language is formed in the form of a dialogue, and the language model thus creates a form of communication and understanding, although it basically uses complex mathematical transformations over vectors. The core part of any language model is its training, and in order for it to form the most accurate data possible, it must be trained on huge data sets, so that it gains a large amount

of "knowledge" necessary to be able to respond in natural language in the context of a text query.

Despite the complexity of the mathematical forms used by the models, their way of functioning boils down to recognizing patterns in large data sets, using neural networks that process information through learned parameters, and focusing on relevant information through self-attention mechanisms. During the training process, the model is adjusted based on the difference between predicted and actual outputs, using backpropagation algorithms, which results in meaningful text in natural language.

3. GENAI IN MULTIMEDIA AND SOCIAL NETWORKS

Conventional artificial intelligence today is mainly used to analyze data to find relevant patterns. Instead of following set rules, GenAI studies the underlying data structure to train models and uses advanced machine learning to generate new content. This allows him to form new results that correspond to "what he has learned". GenAI has the following capabilities:

- Creating new content such as text, images and videos based on patterns in existing data;
- Learning complex structures by analyzing large data sets to understand relationships between data;
- It adapts and improves over time by continuously learning from new data, making its results more accurate.

In the realm of social networks and media, GenAI can be applied to recognize different patterns based on user preferences, which can be used to generate more interesting and diverse content. Recommendation systems driven by artificial intelligence are applied e.g. in e-commerce and digital marketing, improving user experiences through various processes. Platforms like X, Facebook, and Instagram play a significant role in shaping public opinion through influencers and trending topics, but the integration of AI into these platforms is evidently bigger and more significant and brings with it challenges. Language model algorithms can inadvertently lead to discrimination or exclusion of certain groups or users, which can raise a number of ethical issues. The growth of GenAI in online social networks and media offers innovative ways to create new content and interact with it. However, it also has disadvantages such as spreading misinformation and reinforcing biases inherited from training data.

AI content writing software greatly facilitates the ways to create content by reducing the required effort or expertise of the user. Although these technologies are increasingly being adopted in the fields of journalism, education and creative media industries, their potential impact is particularly pronounced in social networking contexts. Social networking platforms play a central role in shaping public opinion, influencing democracy and enabling the rapid and widespread dissemination of information and ideas. Therefore, the introduction of GenAI into these platforms can reshape the dynamics of interaction, authenticity and the nature of online discussions. A growing body of research points to the fact that GanAI enhances human creativity, increases user engagement, and facilitates broader inclusivity in online discussions. However, it also has its negative side, such as a decline in the quality of content, the spread of misinformation and reduced authenticity of user interactions.

The use of GenAI and AI bots in social networks can lead to serious content manipulation, potentially leading to more centralized or "synthetic" social networks. In this sense, GenAI can lead to drastic changes in social network structures and information dissemination mechanisms.

Understanding the basic mechanism of information dissemination in social networks is necessary to accurately determine potentially new collective behaviors, created under the influence of GenAI use. The mechanism of information dissemination in the media is generally determined by the place and time of content creation, as well as the times of its sharing and use, factors such as user interests, temporal patterns of activation, and patterns of connection. With the introduction of GenAI into social media, all of these factors may undergo changes. The GenAI agent can generate high-quality and creative content tailored to the user's interests, which is likely to be shared.

In addition, the GenAI agent may have different temporal activation patterns, compared to the user, where time factors such as weekdays, holidays, or time of day that are important to users may become irrelevant. With the help of big data analysis, the GenAI model can show a more diverse set of connections. In contrast, user-formed connections tend to tend toward homogeneity, shaped by personal relationships and individual interests. All the mentioned factors at the individual level in the dissemination of information can influence the collective behavior at the macroscopic level, such as the moment of information dissemination, the formation of public opinion or the appearance of "echo chamber" effects. If purposefully created, GenAI agents have the ability to influence the spread of information on a larger scale and have a large impact on social media and networks. GanAI agents implemented deep into social networks can be used to spread large amo-

unts of fake political news, mismanage public opinion, or potentially manipulate elections.

In addition to influencing the dynamics of information distribution, GenAI can also shape the topology of social media networks. For example a large number of AI bots can be deployed to interact with other users, leading to the emergence of new clusters and communities for new information dissemination. Studies have also shown that GenAI agents can self-organize, to form network structures with specific topological properties.

GenAI algorithms allow social networks to analyze vast amounts of data—posts, comments, likes, viewing and sharing time—to create models of user behavior. These models are then used in recommendation systems that tailor content to the user's interests, thereby increasing engagement (Teepapal, 2025).

Dynamic monitoring of changes in user preferences enables constant updating of behavioral models (Haque, Islam, & Mikalef, 2025). However, the same mechanisms often lead to "filter bubbles" and "echo" effects, where users are more likely to see information that confirms their existing attitudes (Arkhipova & Janssen, 2024).

The use of GenAI in social networks raises a number of ethical challenges. First of all, algorithms and generative models can be used to spread misinformation and create manipulative content, including video material and false narratives (Kumar & Dwivedi, 2025). Also, the collection of large amounts of data for personalization raises the issue of user privacy and consent (Medhat et al., 2025).

Another significant problem is the bias in the trained models, which can lead to discrimination or undesirable recommendations. Transparency and explainability are key to building trust—research shows that users trust recommendations more when it is clearly explained to them why certain content is being shown to them (Haque, Islam, & Mikalef, 2025).

GenAI is also changing the way public opinion is formed and disseminated on social media. Models can predict which content will go viral and thus automatically amplify it, which changes the dynamics of discussions and the visibility of certain topics.

On the one hand, it can increase the connection and relevance of the content, but on the other hand, it leads to a feeling of manipulation and loss of authenticity (Teepapal, 2025). Also, polarization increases because algorithms often promote content that confirms existing user attitudes (Arkhipova & Janssen, 2024).

CONCLUSION

Generative artificial intelligence is strongly influencing social networks — not just as a technological addition, but as a key driver of change in the way content is created, distributed and consumed. GenAI enables a high degree of personalization, which can significantly improve user engagement, experience and interaction quality. On the other hand, this potential comes with responsibility: risks of spreading misinformation, manipulation, privacy issues, and ethical dilemmas. It is crucial for the future that:

develop regulations and standards that ensure transparency, explainability and accountability in the operation of GenAI-based systems;

stronger user awareness and media literacy, so that people can recognize AI-generated content, understand recommendations and critically access information;

implement technical solutions for detecting deepfakes, bots and manipulative content;

balances innovation and user benefit with the protection of individual rights, ethics and social stability.

This approach allows GenAI in social networks to be a force for good — not only in terms of technological and economic progress, but in strengthening trust and an informed society.

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