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INSTRUMENTS FOR PREVENTING MEDIA DEPENDENCY AND FAKE NEWS USING AI

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Abstract. The article examines the concept of media dependency and the actualization of media surfing problems in all its variations and possibilities of preventing its impact on human activity. The work also outlines the influence of media dependency on the skills of recognizing fake news and prevent its impact on psychological and mental health, the loss of which leads to negative consequences for the functioning of society as a whole. The classification of fakes, particularly based on geographic, temporal, and audiovisual facts that may be turned into disinformation using manipulative techniques, enables understanding the necessity of continuous updating media literacy programs that promote critical thinking, analysis, and evaluation of media content to prevent manipulating information. In turn, AI-based algorithms can monitor the spread pace of fake news on social media platforms and influence correction processes by limiting the reach of such content. Programs like Google Digital Wellbeing and Apple Screen Time provide insights into media usage patterns and help set limits on gadget usage time by sending notifications about the need for breaks and switching to offline activities. The article also discusses preventive measures of avoiding media dependency and the concept media hygiene, adherence to which may strengthen media immunity to the influence of fake news.

Key words: media consumption, media hygiene, media surfing, content, media immunity, manipulation, media literacy.

Introduction. Media dependency has become an abundant phenomenon driven by the crises of recent years and the excessive use of gadgets and network services, indispensable for obtaining information in today's world. This information may either help individuals develop within the modern knowledge society or contribute to their degradation due to the influence of misinformation, fake news, and manipulation. Consequently, media dependency in the form of the excessive and compulsive use of digital media, including social networks, online games, streaming services, and other digital platforms may have negative consequences such as decreased productivity, deterioration of social relationships, and mental health issues like anxiety and depression. All this necessitates regulation, including time limits, content management, conscious consumption, digital literacy, media literacy, and the use of AI algorithms for maintaining the principles of media hygiene and preventing media dependency.

Main part. The aim of this study is to investigate the process of developing media dependency and its impact on recognizing fake information, disinformation, and manipulative content.

The task set during this research involves examining the factors influencing media consumption and establishing control norms of preventing media dependency. Additionally, the study aims at advancing suggestions for recognizing fake information based on the classification principles of fake fabrication and through the use of AI algorithms.

To outline in detail the research topic related to media dependency and fake news through the lens of media hygiene and AI we applied a sociocultural methodological approach, complemented by several scientific methods, ensuring the comprehensiveness and depth of the research. Focusing on understanding how social and cultural contexts influence human behavior and interaction with media, we have acknowledged the complex relationship between media practices, societal impact, and tech-

nological solutions paving the way to developing effective strategies of improving media hygiene and utilizing AI to foster a healthier media environment. Moreover, by examining the conflicting forces of media dependency (e.g., user engagement vs. negative mental health impacts) and fake news (e.g., spread pace vs. accuracy), we were able to classify types of fakes for further recognition. We concluded that modern tools such as AI when used relevantly and responsibly may serve for building a conscious, media-literate society

Materials and methods of research. The research primarily used the studies by world scientists, including founders of media dependency theory M. L. De Fleur and S. Ball-Rokeach, and their followers K. Miller, T. Morton, P. Ratwaddana, G. Wilkin, who insist that media dependency is connected to "information systems involved in the process of forming stability, changes, and conflicts at the societal and individual level" (Ball-Rokeach, 1985: 498). Given the emphasis on stability, which, in turn, is disrupted by the dissemination and perception of fakes, it should be noted that the issue of fake news is relatively new in scientific discourse. However, comprehensive studies on this subject may be found in the high-value pilot studies of O. Arkhipova, V. Vovk, V. Grebenyuk, M. Kitsa, L. Makarenko, I. Mudra, O. Nevelskaya-Gordeeva, E. Parshakov, O. Saprykin, V. Tsymbalyuk, R. Chernysh. Their research reflect the essence of fake as the specific content which emotionally pertains to vital issues and affects societal integrity causing both internal (personal) and external (public) destabilization (Vovk, 2022: 82).

Results and discussion. For better understanding the specified problem, in our opinion, it is necessary we should recognize media hygiene as one of the critical tools for preventing media dependency which understanding requires studying the internal dynamics and behavior of individuals who uncontrollably consume media. Media dependency, like other forms of addiction, may be a complex and multifaceted phenomenon enhanced by various factors: in particular, continuous and excessive consumption of media content (watching television, social networks, video games, or engaging in other forms of media). This may lead to psychological dependency as an outcome of the emotional and psychological satisfaction derived from media experiences, for turning to mass media may sometimes serve as a mechanism of escapism – the way of coping with stress, anxiety, or boredom. Thus, consuming appealing media content, such as social media notifications, video games, or watching series, may provoke the release of dopamine in the brain, fostering addiction-like patterns, as dopamine is a neurotransmitter associated with the brain's reward system (Barchi, 2022: 88). Engaging in activities sending the brain pleasure or reward signals that it is enjoyable or beneficial, reinforces the behavior and motivation to seek similar experiences in the future. Over time, repeated exposure to these rewarding stimuli may lead to the development of habituation patterns, compelling participation in such behavior despite negative consequences.

Modern media, aiming at ensuring their well-being and user engagement, often design their products to seem very appealing and beneficial to users. Features such as likes, shares, comments, notifications, leveling up, and cliffhangers in series may trigger dopamine release and encourage users to return for more. Thus, engaging media content fosters addiction-like behaviors, such as excessive screen time, neglect of other responsibilities, disrupted sleep patterns, and withdrawal symptoms when access to content is unavailable. Such behavior may negatively impact mental health, productivity, and overall well-being. Therefore, while engaging with media content can be enjoyable and entertaining, it is important to practice moderation and mindfulness to avoid addiction. Setting limits on screen time, taking regular breaks, engaging in alternative activities, and seeking support if having difficulty controlling media consumption can help maintain a healthy balance.

It is also worth noting that constant use of the internet, social networks, and television provokes fears of missing out on important information, news, and social interactions. This fear urges even greater use of gadgets, leading to "compulsive media surfing" as a manifestation of dependency – overloading due to an obsessive, irresistible need to seek information. The emergence of this need

is partly explained by the media dependency theory of American researchers S. Ball-Rokeach and M. De Fleur, who emphasize that "media are information systems involved in the process of forming stability, change, and conflict both at the societal and individual levels. Individuals become dependent on the knowledge and evaluations shared in the media space, and this dependency increases if society is in a state of transformation or conflict" (De Fleur M., Ball-Rokeach S. 1982: 97).

The phenomenon of "media surfing" ("swimming" or "wandering") is very noticeable today in the context of media consumption, especially among the young. It raises certain concerns that the amount of information does not always correspond to its quality nor necessarily impact its assimilation for aimless use of media often leads to a superficial understanding of issues and events. Moving from one source to another without in-depth exploration may hinder the development of critical thinking and deep understanding, as well repeated switches from one platform to another may fragment attention, making it difficult to focus on one topic or task for a prolonged period.

Overcoming excessive media surfing is a gradual process that requires patience, self-awareness, and consistent efforts, including managing one's media environment and prioritizing meaningful, informative, and enriching content, as well as maintaining the balance between online and offline activities. All of this lays the foundation of media hygiene, the necessity of which is also dictated by such realia as control of fake information, which is similar to barrier methods of protection used in life as well in the information environment, it is necessary to protect oneself from harmful information, particularly fakes.

Let us touch up that a fake is a message with reduced value for society that attempts presented as valuable. As the researcher from Lviv I. Mudra notes, "a fake is often referred to as unreliable, false information, or unchecked facts, but these concepts do not reflect the essence of a fake. A fake is a forgery, a falsification, specifically disseminated to misinform the audience" (Mudra, 2016: 186). There are various classifications and markers of fakes, understanding which can help avoid the influence of unreliable information:

- Absolute lies – often used to report of alleged danger or someone's death;
- Partial lies – used in a generally truthful message but with distorted interpretation of real events. The facts remain unchanged, but added much subjective and evaluative judgments making it impossible to crystallize the actual fact;
- Information concealment – created not by the presence of false information, but by the absence of the authentic fact.

Understanding the nature of fake information, its reliability and authenticity is possible by identifying different types of fakes, particularly by the degree of spatial-temporal reliability:

- Geofakes – manipulations with location data may be used to launch bogus narratives or establish fake events;
- Manipulating timestamps – changing the timestamps of digital content to make it appear current or convey a sense of urgency; historical distortion of events or timelines, often spotted in historical revisionism and conspiracy theories;
- Deepfakes – manipulating video and audio to make highly convincing fake content, hardly distinguished from real recordings;
- Bots and automated accounts on social networks, used for disseminating fake information often at a fast pace;
- Crisis and emergency disinformation often associated with natural disasters, crises, or emergencies, may be spread to provoke panic or confusion;
- Time-traveling narratives may claim that information or predictions were made in the past, but ignored, implying an element of conspiracy or cover-up.

Along with spatial-temporal characteristics, fakes can also be distinguished by the information source. Among them are: unreliable source, using a fake face of organization that is an unreliable

source having a clear interest in a particular interpretation of information; secondary source not being the main actor, but which is not specified; unverified source, who can be an eyewitness to events (consumers of information tend to think that if a person was present at the event, they will provide the truthful information, however this is far from that from police observations: no one deceives as much as an eyewitness) whose information needs to be verified by another source; panicked witness – a witness who is emotionally involved in the event, so their words should be interpreted only as their individual opinion.

Besides, one can talk about the classification of fakes by their goals including: attracting attention, spreading false information to gain any advantage, manipulating the audience to provoke specific actions from making a purchase to a strike or rally, and fraud to seize funds.

There are certain markers of fakes that may be flagged in headlines, main text, images, videos, etc. If several markers are detected in one message, it is worth considering its reliability. However, it is important to remember that the term "fake" is applied only to news or messages that are presented as news. If we are dealing with an opinion, we cannot interpret it as fake.

Detecting all types of fake information often requires involving a combination of technological tools, digital forensics, and critical thinking skills. Analyzing spatial-temporal, source, and target characteristics, along with other contextual features, can help identify discrepancies or inconsistencies that may indicate unreliable information (Semchyshyn, 2016).

Given the trends of digitalization, virtualization, and network dependency, when social networks, in addition to entertaining content, may become a breeding ground for fakes and conspiracy theories, inciting people against each other, scientists from all over the world are working on developing effective instruments against the emergence and release of fake news. One of such initiative is the Reconnaissance of Influence Operations (RIO) program, aimed at combating the spread of false information and identifying the individuals or organizations behind it. Developed by scientists from the Lincoln Laboratory at the Massachusetts Institute of Technology (MIT), RIO uses AI for detecting independently fake messages spread on social networks. The main goal of this software is gathering information about the tactics and strategies of malicious actors disseminating fake news and disinformation. By analyzing patterns, trends, and characteristics of false information, RIO strives to develop advanced algorithms capable of effectively identifying and countering such content (MIT Lincoln Laboratory, 2023). The development of RIO highlights the growing importance of using technology and AI to address disinformation issues for better understanding the dynamics of influence and developing more targeted strategies of mitigating this impact on society.

The RIO developers acknowledge that while the program is not perfect, it has achieved significant success in revealing accounts posting fake news, with a detection rate of 96%. This achievement highlights the uniqueness of the software and its effectiveness in combining multiple analytical methods of gaining a comprehensive understanding of false information dissemination. S. Smith and E. Kao, members of the research team, emphasize that accounts with high activity levels often have a significant impact on social networks. However, traditional metrics, such as the number of retweets, may not provide an accurate picture of the influence of these accounts. To address this limitation, the program applies a statistical method that evaluates not only the spread of disinformation by accounts but also how such false information affects other groups, communities, or individual accounts on social networks (Smith S., Kao E., Mackin E., Rubin D., 2021: 3).

In addition to the aforementioned software, which we also consider one of the preventive methods of media hygiene, it is also worth remembering the benefits of AI as a whole for recognizing false information. AI-based algorithms are trained on extensive datasets containing both authentic and manipulated media to study patterns and characteristics indicating digital manipulations, as well as analyze visual content pixel by pixel for flagging discrepancies, artifacts, and inconsistencies.

Discussion. Detecting changes, such as deepfakes (based on generative adversarial networks (GAN)) in realistic synthetic media that mix elements from different sources, is enabled by various techniques and methods including:

• Digital content analysis helps identify inconsistencies or violations in patterns indicating manipulation or forgery;

• Feature extraction to determine specific characteristics or attributes of digital content can distinguish characteristics such as color distribution, textures, edges, and shapes to specify changes or edits;

• Convolutional neural networks (CNNs), which analyze images, and recurrent neural networks (RNNs), which analyze text, can detect complex patterns and features;

• Identification of changes and modifications in digital images and videos allows detecting instances of plagiarism, copyright violations, and content manipulation;

• Evaluation of contextual information, such as timestamps, geolocation data, and historical trends, helps flag anomalies and discrepancies that may indicate data fabrication.

Aggregating various methods allows AI to achieve greater resilience against aggressive attacks and complex manipulation techniques, which is valuable for maintaining media hygiene. Equally important, AI algorithms can analyze metadata, timestamps, and contextual cues to assess the authenticity and integrity of videos and images. By assessing sentiments, emotional tone, and subjective biases in content, AI can distinguish factual messages from opinionated or biased narratives. Furthermore, AI-based fact-checking tools cross-refer claims and statements with authoritative sources and databases, flagging inaccuracies and providing users with context and verification. Thus, through continuous analysis and optimization, AI algorithms adapt to new challenges and enhance their effectiveness in maintaining media hygiene.

Conclusions. One of the current challenges Ukrainian society faces today is the abundance of fake news and its negative impact on the public. Addressing to this issue is crucial for ensuring the effective functioning of a conscious and responsible society and requires an awareness of the need to develop preventive norms able to avert media dependency. These preventive measures comprise the concept of media hygiene, which safeguards against the influence of fake information and its destructive power. Therefore, to avoid media dependency and the impact of fake news on mental and psychological health, we propose the following: implement comprehensive media literacy programs of teaching critical thinking and fact-checking skills; encourage cooperation between strands of media (both traditional and multimedia) to share verified information and debunk false claims; enhance the responsibility of media professionals in adhering to codes of conduct to ensure responsible reporting; deploy AI systems, able quickly identify and flag false information on social media platforms and news websites; invest in technologies that can detect and counter deepfakes and other complex forms of digital manipulation. Overall, combating fake news and its harmful effects, as well as preventing media dependency, are vital for the safety and stability of Ukrainian society. Accordingly, the integration of media hygiene measures, the use of AI algorithms, and the conscious and responsible work ethics of media professionals will enable a robust media immunity for national consciousness and identity.

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