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Digitisation and artificial intelligence in the world of media

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This paper explores the dynamic interplay between digital media and artificial intelligence (AI), and their impact on the media industry. Digital media, encompassing platforms and content accessible through electronic devices, has revolutionised communication, content natural language processing (NLP) and machine learning, creation, and consumption. The rise of AI has transformed digital media by enabling personalized experiences and innovative applications across diverse media formats. The types of digital media, including text-based, audio-based, image-based, and video-based content, are examined along with their characteristics and significance in contemporary media landscapes. The paper also looks into the integration of AI in diverse media industries such as newsrooms, advertising, music, television, film, augmented reality (AR), and virtual reality (VR). Examples of AI in these sectors highlight its role in enhancing productivity, personalization, and audience engagement.

Key words: Artificial intelligence, mass media, films, journalism, digital media.

INTRODUCTION

Digital media refers to media content encoded in machine-readable formats. It includes software, digital images, audio files, videos, web pages, social media platforms, digital data, and e-books, enabling creation, viewing, modification, and preservation on digital devices such as computers, tablets, and smartphones for the dissemination of information (Das, 2020). Traditional forms of media such as newspapers and magazines have been supplemented by emerging digital platforms in the form of e-newspapers and e-magazines. This evolution of digital media has drastically increased accessibility, allowing for easy distribution and consumption of content.

Prensky (2001) coined the terms ‘digital natives’ and ‘digital migrants’ to demarcate individuals who were born and grew up in the digital age versus those who adapted to digital technologies later in life. Digital natives are people who were born after the internet developed in the early 1980s, which include Millennials, Gen Z, and Gen Alpha. This distinction highlights the generational divide in digital literacy and proficiency, emphasizing the importance of understanding how individuals engage with and navigate digital media in present-day society. As digital natives dominate the media consumer market, digital media has apparently democratized the creation

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and sharing of content, allowing anyone with access to digital tools to produce and publish their media. This has given rise to a more diverse range of voices and perspectives in the media landscape. The paper addresses the challenges arising from the intrusion of artificial intelligence (AI) in digital media, including algorithmic bias and misinformation, particularly through social media. AI may hallucinate certain contexts that human beings are not placed with. It stresses the importance of media literacy and regulation to mitigate these challenges and ensure the reliability of digital media content. By safeguarding against harmful practices, stakeholders in the media industry can harness the power of digital media and AI to create a more inclusive and informed media landscape for the future.

RISE OF AI IN DIGITAL MEDIA

Historians specializing in media and technology have found that with each new technology, a broad range of hopes and fears are projected. With the establishment of new media studies, researchers have explored the cultural narratives surrounding digital technologies, often referring to them as “imaginary” or “modern myths.” Like past communication advancements, public discussions about digital media, including personal computers, e-readers, smartphones, and the internet, are heavily influenced by speculations, fantasies, and visions of the future (Das, 2020). The rise of artificial intelligence in digital media has transformed the landscape of content creation and consumption. AI algorithms are increasingly employed to personalize user experiences, optimize content delivery, and enhance engagement. AI’s natural language processing (NLP), such as machine translation, summarization, and spellcheck, helps machines process and understand human language to perform repetitive tasks automatically. Machine learning, such as smart assistance, customer service, and speech recognition, is being used by digital media companies to analyse user data and deliver personalized content. For example, Netflix uses algorithms powered by machine learning and NLP to analyse user behaviour, preferences, and viewing history. These algorithms then suggest personalized films and TV shows to each user based on their tastes and interests. Like calculators, cutting-edge AI finds its way into everyday applications, often without being labeled as such, and it is commonly referred to as a computer program, algorithm, or app. Traditional AI analyses historical data and makes future numeric predictions. Generative AI allows computers to produce new outputs that are indistinguishable from human-generated content.

Types of digital media

Types of digital media are mainly text-based content, audio-based content, image-based content, and video-based content. Text-based content refers to any form of digital media that relies on written text for communication. This includes websites where text-based information is organized and presented on web pages. Blogs, where individuals or groups regularly publish written content on topics of interest, for instance, in WordPress, Medium, and Blogger, allow bloggers to share their perspectives and engage with readers through articles and posts, ranging from personal reflections to professional insights. LinkedIn uses AI algorithms to suggest job openings and career opportunities based on the user’s skills, experience, and career interests. Digital media includes articles on various online platforms, including news websites, magazines, and online journals. In the newsrooms of print media, pagination has integrated the prepress job (earlier done by non-journalists) with that of journalists.

Audio forms of digital media include digital radio stations, podcasts, audiobooks, and music streaming services like Spotify and Apple Music, which provide a wide range of musical stations and allow users to listen to databases of millions of songs. Radio programs can also be streamed on the internet using sites such as I-Radio. Image-based content refers to digital media that relies on visual elements rather than written text to communicate messages. For example, info graphics are visual representations of information or data, combining text, icons, illustrations, and graphical elements to convey information, making complicated scientific information more accessible. Memes are humorous images, videos, or text snippets that spread rapidly across the internet through social media.

Digital media platforms prioritize visual content, with services like Netflix offering streaming services for films and TV shows. Among these platforms, YouTube stands out as a major player, hosting an extensive library of billions of videos. Since its launch in 2005, YouTube has become widely visited and extremely popular among internet users.

Importance of digital media

Global reach allows content to be accessible to audiences worldwide, whether it is televised programming or online newspapers. This widespread accessibility breaks down geographical barriers and facilitates the dissemination of information and entertainment on a global scale. Digital media offers interactive capabilities that engage users. Features like comments, likes, and shares are commonly found on social media platforms. Audiences can take an active part in discussions, share their opinions, and contribute to the content they consume. This interactivity enhances the overall user experience and creates a sense of community around digital content. For instance, platforms like Facebook are viewed as dynamic digital media, where the structured environment encourages active participation. Users

engage in a continuous cycle of sending, re-sending, and receiving media content, collectively shaping the platform's content landscape. All Facebook users are interconnected in this ecosystem, sharing a common virtual space despite physical separation (Bateman, 2021).

Digital media is more cost-effective compared to traditional media channels. The lower production and distribution costs associated with digital platforms make it easier for content creators to reach their target audiences without the financial constraints often encountered in traditional media formats. Over-the-top (OTT) platforms also provide opportunities for low-budget film productions to gain exposure and reach audiences globally. OTT has particularly stimulated the younger generation, as it is easy to watch on mobile phones with affordable subscription packages (Yeole et al., 2022).

The increasing integration of AI is evident within the media and creative sectors. Historically, creatives have eagerly embraced new tools to enhance their workflows, making them quick to adopt technological advancements, and AI is no exception. This technology appears well-matched to the unique demands of creative industries, and it is currently reshaping existing paradigms (Amato et al., 2019). A set of AI tools widely used by media personnel are listed in the Appendix along with their descriptions.

AI IN NEWSROOM

The advantage of digital media is its ability to provide real-time updates. Online news portals update content to reflect the latest developments in a story as they unfold. This immediacy allows audiences to stay informed about current events and trends as they happen, enhancing the relevance and timeliness of digital media content. One application of AI in a newsroom is the transcription of audio interviews or discussions into written content, facilitating the archival and easier dissemination of information. A study by the Associated Press (2024) found that nearly 70% of newsroom staffers from various backgrounds and organizations surveyed are using the technology for crafting social media posts, newsletters, and headlines; translation and transcribing interviews; and story drafts and other uses. One-fifth said they are using generative AI for multimedia, including social graphics and videos.

The core principles of journalism, such as storytelling, balance, copywriting, and editing, are fundamental for maintaining the credibility and trustworthiness of news. AI-powered tools can now automatically generate written articles, audio clips, and even video content. The BBC possesses a considerable volume of data encompassing daily news, features, and videos. The tool used by the BBC monitors sources, extracts information, and gathers articles not only from the BBC but also from various global media outlets. Relevant stories are tagged with simultaneous segmentation based on categories such as locations, individuals, organizations, and other relevant topics (Sancanin and Penjisevic, 2022). This capability can significantly speed up the production process and help newsrooms produce more content efficiently. For instance, using the Connexun news interface, journalists can track news in real-time, gain strategic insights through AI-driven media intelligence, and conduct market research.

Earlier, news media such as newspapers set the agenda for the public, as McCombs and Shaw (1972) argued. With the advent of social media, news media are forced to pick up stories from social media, which do not have editorial rigor.

This is called reverse agenda-setting, a phenomenon where traditional news outlets find themselves in competition with numerous online sources, leading to major impacts on the quality and accuracy of news reporting. This journalistic shift towards social media has sparked concerns regarding the reliability and impartiality of news, thereby adding complexity to the information ecosystem. For instance, X (formerly Twitter) has become a debate platform, making it possible to circumvent traditional media. During the Chennai floods of 2015, social media provided on-the-spot reporting of people in flooded houses, places that required relief, and information on rescue and food availability – much better than the mainstream media, which largely came to a standstill soon after the flooding. In this instance, mainstream media picked up several stories from social media, with ordinary people playing the role of journalists in the process of reverse agenda-setting. Thus, instead of newspapers, radio, and television setting the agenda for the public, social media reversed the process and set the agenda for mainstream media.

AI in advertising

Huh et al. (2023) argue that AI advertisement is not always of the human type but can also be of the machine type or a blend of human and machine. AI in advertising does not seek to supplant human creativity or judgment; rather, it serves as a complementary tool. It assists in generating ideas or collaborates with human creative, enhancing the creative process rather than replacing it. For instance, Jasper AI is used for copywriting and Lexica Art for creating realistic images that can be used to generate marketing content. AI functions as a facilitator by providing valuable insights and data-driven recommendations. It enables a streamlined workflow, allowing for the rapid progression from idea conception to execution. This efficiency is particularly beneficial in the fast-paced world of advertising, where timely delivery is essential.

By analyzing customer expectations and behaviors, AI assists in identifying patterns and preferences. Advertisers can deliver more personalized and relevant

messaging using this customized content, enhancing the effectiveness of their campaigns. For instance, Amazon has a virtual try-on service for shoes, aiding consumers with iPhones to see how shoes will look on their feet. This uses augmented reality to enable customers to visualize how a pair of shoes will look on. The use of AR allows shoppers a more personalized experience without the need to try something on physically and also reduces return rates. Using Amazon's app, one can select a shoe, tap the "virtual try-on" button, and then point the camera at their feet to see how the shoes look on. They can also move their feet to see how the shoe looks from every angle and use the carousel to swap colors of the style without needing to exit the experience (Kenyon, 2022).

AI in music

Music has been an integral part of human culture and creativity throughout history. AI is set to revolutionize the music industry. AI has already begun to change the process of music creation by providing new tools and techniques for composers and musicians. One notable application of AI in music is the ability to generate compositions autonomously. For instance, music director A.R. Rahman recently used AI to recreate the voices of late singers for a song in the film 'Lal Salaam'. Faced with criticism, he said that AI is a tool for advancement rather than a threat to jobs (TOI Entertainment Desk, 2024).

Spotify's AI feature creates playlists based on text descriptions. For example, users can type in a prompt such as "music to suit a hot, sunny day" to get a playlist of songs that matches the context. Major record companies have sued artificial intelligence song generators Suno and Udio for copyright infringement, alleging that the song generators used training data for their AI models without obtaining the necessary licenses. The songs produced by these platforms include elements such as melodies, lyrics, and arrangements that are similar to the original copyrighted works. By creating and distributing music that closely resembles copyrighted works, these AI platforms could divert listeners and earnings away from original artists. The defense argument could be that (1) the use of copyrighted music falls under fair use, particularly if the AI-generated content is transformative, or (2) their models provide a new way for artists to engage with their music.

AI in television and films

The use of AI in the film and television industry is growing exponentially. AI is being employed in various aspects of production, from content creation to distribution and consumer analysis. AI technology has the potential to enhance the speed at which film scripts are produced, often reducing the time needed to write a script to just one hour. This rapid turnaround enables creators to generate their scripts quickly. AI script-writing tools can also swiftly gather pertinent information and data, aiding authors in uncovering subtle plot clues and constructing more intricate narratives (Sun, 2024).

AI is also used in production and post-production. For example, OpenAI's Sora, launched on February 15, 2024, as a text-to-video creator, can create a one-minute video. Further, Runway uses words and images to create new videos out of existing ones, adds voiceover from text, and Wonder Studio automatically animates CG characters into live-action scenes. Google Workspace adds generative AI features such as AI-powered film production software. Google Vids helps develop, produce, and edit videos in one app using AI. Tamil films use the Mocobot robot to capture sharp visuals that would be hard to get by hand or other means, with the film 'Beast' setting the trend. Furthermore, Meta has launched a new AI tool that can generate or retexture 3D objects in less than a minute.

The National Geographic channel uses virtual reality to bring its audience closer to nature and wildlife. Its 'The Protectors' VR series showcases efforts to combat elephant poaching in Africa. 'Antarctica' provides an immersive journey to the icy continent, highlighting the effects of climate change. In a thrilling expedition of Antarctica, the filming team climbs a massive ice shelf and defies a raging snowstorm in search of a lost emperor penguin colony. Photojournalists use 360-degree and virtual reality optical technologies to turn photographs into immersive, digital natural world experiences. Such an interactive experience lets you discover the world without ever leaving home.

POPULAR DIGITAL PLATFORMS

Various digital media platforms have become integral parts of modern life, offering diverse opportunities for communication, content creation, and entertainment. Social media platforms like Facebook, Instagram, X, and LinkedIn have revolutionized how people connect and interact online. These platforms enable users to share updates, photographs, and videos, engage in conversations, and build networks with friends, family, and professionals across the globe. AI-powered image recognition technology automatically suggests relevant hashtags and filters for photographs uploaded on Instagram.

Content-sharing platforms such as YouTube, Vimeo, and TikTok provide users with the means to upload, share, and discover a wide range of multimedia content, including videos, music, and short videos. These platforms empower creators to reach vast audiences and express themselves creatively.

Streaming services such as Netflix, Hulu, Spotify, and Apple Music have transformed the way people consume

media, offering on-demand access to a vast library of films, TV shows, music, and podcasts. Netflix's animation 'The Dog and the Boy' uses AI for content creation, with credits for background designer as 'AI (+Human)'. These services provide convenience and flexibility, allowing users to enjoy their favorite content anytime, anywhere.

Facebook and Instagram provide more insight into people's lives than the personal sections in newspapers ever did. Netflix, HBO, Twitch, TikTok, and YouTube challenge the positions held by commercial and public broadcasters in the culture and entertainment sectors (Trattner et al., 2021).

Augmented and virtual reality

Augmented Reality (AR) is a technology that enriches the real-world environment by overlaying computer-generated content onto it. Virtual Reality (VR) is a technological advancement that has transformed our engagement with digital environments, reshaping how people perceive and engage with them. Through the use of state-of-the-art computer graphics, motion sensors, and display systems, VR empowers individuals to immerse themselves in realistic simulations of both real and imaginary environments. It has demonstrated its immense value in sectors such as gaming, education, healthcare, and real estate (Al-Ansi et al., 2023).

VR and AR technologies are transforming education by creating immersive learning experiences. Students can explore virtual environments, conduct virtual experiments, and visualize complex concepts in subjects like science, history, and art. AI in virtual simulations and interactive experiences makes education an immersive experience like gaming. Information delivery using AI is superb when combined with technologies like virtual reality, 3D, and simulation. For example, the 3D animation of Vikram's lander in the moon mission was exemplary.

Currently, ChatGPT-4 can be accessed for free through multiple ways without a subscription. ChatGPT-3.5 has already helped generate human-like content in various applications, such as drafting emails, writing articles and blogs, answering questions, and creating chatbots. Microsoft has partnered with OpenAI to gain early access to the generative AI technology developed by OpenAI. The company has also invested billions in GPT-4, allowing it to use the latest version of GPT-4 in the Bing AI chatbot. Microsoft recently launched the latest version of Windows 11 (23H2) and introduced the Microsoft Copilot. The Microsoft Copilot uses the GPT-4 model from OpenAI, which means that you can access GPT-4 for free with the Copilot. In addition, Copilot is integrated with Microsoft applications such as Outlook, Paint, and Photos, further enhancing its capabilities. According to OpenAI (2024), it spent six months making GPT-4 safer and more aligned. GPT-4 is 82% less likely to respond to requests for disallowed content and 40% more likely to produce factual responses than GPT-3.5 on its internal evaluations. In May 2024, OpenAI introduced GPT-4o, to withstand competition from Google. It offers GPT-4-level intelligence but is faster and enhanced in text, voice, and vision capabilities. In fact, Bard, later modified as Gemini by Google, was not able to compete with ChatGPT as it was sometimes seen as historically incorrect by presenting President George Washington as black or inventing female Popes—a classic example of hallucination—which forced Google to pause its image generation tool temporarily.

Challenges and ethical issues

Ethical issues surrounding AI include the potential for hallucination or bias in algorithms, leading to inaccurate outputs. Panch et al. (2019) focus on two of the most significant ethical considerations: algorithmic bias and the demand for fairness in AI systems. Algorithmic bias occurs when an AI system produces unfair or inaccurate results because it has learned from biased data, such as human biases or its own hallucinations. Large datasets used to train AI systems may be biased or reflect social injustices.

The increase in digitalization and the emergence of new business models have intensified competition within the media industry. Misinformation and fake news generated by AI represent significant challenges in the digital age. The shift in news consumption has seen social media platforms like Facebook, YouTube, WhatsApp, and Instagram surpass traditional news organizations as primary sources of information for individuals. These platforms offer a convenient and personalized experience, allowing users to access a wide range of news content. However, with the intervention of AI, distinguishing between disinformation (false information intended to mislead) and misinformation (false information spread unintentionally) on social media can be challenging.

ChatGPT articulates its mission to provide reliable information across diverse scientific topics, enhance public understanding of scientific concepts, dispel misconceptions, and foster dialogue. AI systems like ChatGPT, Gemini, or Copilot may generate content that lacks accuracy, requiring users to approach outputs with skepticism. The lack of transparency about data use and decision-making processes raises questions about safety and accountability.

Moreover, issues regarding authorship and copyright arise with AI-generated content, complicating ownership and intellectual property rights. AI detectors like Scribbr may struggle to accurately identify AI-generated content, especially if questions are framed intelligently. This problem could be mitigated in the future as AI is further trained to recognize such nuanced questions and link them with AI detectors for better identification.

CONCLUSION

The evolution of digital media has transformed how information is created, consumed, and shared. With the rise of AI technologies, digital media is becoming increasingly personalized and interactive, profoundly shaping media experiences. From text-based to audio-based content, and from newsrooms to advertising, AI is revolutionizing various sectors of the media industry, offering new tools and capabilities to enhance creativity and efficiency, though it may also impact creativity and originality.

Alongside these advancements come significant challenges and ethical considerations, including algorithmic bias and misinformation. The dominance of social media platforms presents complex issues that need to be addressed to ensure the integrity and reliability of digital media content. Additionally, there is a tendency for some to rely heavily on AI tools for communication tasks, which could lead to concerns about the diminishing quality of communication. As the saying goes, AI tools like ChatGPT may make less engaged individuals more reliant on technology, while potentially benefiting those who are already adept at leveraging such tools.

AI may change the nature of some jobs and increase the demand for a more skilled workforce, though this does not necessarily imply a reduction in job opportunities. Digital media has dramatically transformed communication, interaction, and information processing. While it presents immense opportunities for connection and innovation, it also brings challenges related to mental health and the spread of fake news. Despite these challenges, digital media and AI hold the potential to democratize access to information, amplify diverse voices, and drive social change. With appropriate safeguards against harmful practices, the power of digital media and AI can be harnessed to create an inclusive and vibrant media landscape.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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APPENDIX

Appendix 1. Some useful AI tools and their descriptions.

ChatGPT	A computer program that can understand and respond to human language just like a virtual assistant. It can hold conversations, answer questions, and engage in a dialogue on a wide range of topics.
Character.ai	An AI chatbot application used for interactive conversations to chat with various characters and to create personalised interactions.
QuillBot	A paraphrasing tool which helps the students and professionals to rewrite, edit and change the tone of their text.
Grammarly	An AI writing assistant which helps with grammar, spelling and usage, wordiness, style, punctuation, tone, and even plagiarism.
Perplexity AI	An AI chatbot that answers queries using the natural language predictive text.
Midjourney	A tool used for crafting images from text inputs.
Claude AI	An AI chatbot which generates various forms of text content such as summaries, creative works, and codes.
Canva	A tool used to create social media posts, presentations, posters, videos, and logos.
Hugging Face	Community that helps users build, deploy, and train machine learning models.
Gemini	An AI chatbot tool designed by Google (replacing Bard) to simulate human conversations using natural language processing (NLP) and machine learning.
Microsoft Copilot	A virtual assistant enhanced by AI to boost productivity and efficiency in various work settings.
NovelAI	A tool used by authors and story tellers to write more imaginatively and faster.
CapCut	An AI platform that enables video editing and image.
JanitorAI	An AI chatbot where one can interact with different types of characters.
Civitai	Used to generate hyper realistic images.
DALL.E	A generative AI technology that enables users to create new images with text to graphics prompts.