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Research Scan on the Impact of the "Metaverse" on Journalism and Communication (Post-print)

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Date: 2023-10-08T00:00:00+00:00

Abstract

In 2021, both academia and industry initiated research on the "metaverse", with related studies demonstrating explosive growth. Academic circles analyzed the characteristics and advantages of the "metaverse" from multidisciplinary perspectives, endeavoring to establish a clear conceptual definition. By reviewing literature related to the "metaverse", one can gain a more concrete understanding of its essence from multidimensional viewpoints—such as what impacts the development of the metaverse will have on journalism and communication, what its future development trends will be, and so on. These issues warrant urgent attention and investigation.

Full Text

A Scanning Study on the Impact of the "Metaverse" on Journalism and Communication

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Abstract: In 2021, both academia and industry launched research on the "Metaverse," with related studies showing explosive growth. Scholars have analyzed the characteristics and advantages of the "Metaverse" from multidisciplinary perspectives, striving to provide a clear conceptual definition. By reviewing relevant literature on the "Metaverse," we can gain a more concrete understanding of its essence from multiple dimensions. Questions such as what impacts the Metaverse's development will have on journalism and communication, and what its future development trends will be, urgently require attention and research.

Keywords: Metaverse; Journalism and Communication Development; New Technology; New Applications

The concept of the Metaverse originated from mathematician Vernor Vinge' s 1981 novel *True Names*, which creatively conceived a virtual world accessed through brain-computer interfaces for sensory experiences. In 1992, Neal Stephenson' s sci-fi novel *Snow Crash* introduced the terms "Metaverse" and "Avatar," referring to an extended reality (XR) environment and the internet applications and social life forms that integrate virtual and real worlds, driven by technologies such as digital twins, blockchain, and AI [1]. XR devices enable information to be presented in a fully authentic manner, blurring the boundaries between real and virtual while eliminating distinctions between online and offline. The year 2019 marked the commercial launch of 5G, whose high speed, low latency, and large bandwidth provide more creative space for virtual reality technologies, compensating for current technical limitations and enabling iterative upgrades. The Metaverse is a world parallel to physical space, yet also one that merges with it, and ultimately a digital virtual world that can transcend physical space.

Wikipedia defines the Metaverse, also called the post-universe, metaphysical universe, metaworld, hyperspace, or virtual space, as a future persistent and decentralized online 3D virtual environment. However, defining the Metaverse solely from a spatial construction perspective is clearly insufficient, as it fails to reveal its core essence and internal logic. Reviewing relevant literature and analyzing its essence from multidisciplinary perspectives can help innovate journalism and communication development with clearer "Metaverse thinking."

1. Multi-Dimensional Understanding of the Metaverse Concept

Academic interpretations of the Metaverse concept currently exhibit considerable multidimensionality and diversity, with scholars employing multiple perspectives to conduct profound and critical reflections on the concept and related applications, striving to explore its deeper essence.

1.1 The Metaverse as a Technological Extension of the Real World

Technology serves as the foundational support for Metaverse development. In this integrated environment, the virtual-physical interface created by technology acts as a crucial window connecting the virtual and real worlds, representing a comprehensive extension of real-world politics, economy, culture, and social interaction. Continuous iterative upgrades in virtual reality (VR), augmented reality (AR), mixed reality (MR), big data computing, and blockchain technologies are gradually materializing the Metaverse concept. Whether through text interaction, graphical interaction, or video-based social interaction, or through content creation tools, the Metaverse world represents an extension of the physical environment under technological enhancement. In 2021, Tsinghua University' s New Media Research Center summarized Metaverse construction as three stages: digital twinning, virtual-real symbiosis, and virtual-real integration. Digital twin and simulation technologies enable virtual spaces to continuously imitate, replicate, and reflect physical spaces. Under the impetus of digital

twins, blockchain, and AI technologies, the relationship between virtual and real evolves from clear separation to mutual accompaniment, ultimately achieving integration [1]. XR interactive devices allow information to be presented in a fully authentic manner, merging the boundaries between real and virtual while eliminating distinctions between online and offline.

1.2 People Integrating into the Metaverse with Digital Identities In the operational logic of the Metaverse, humans occupy a vital subject position, participating in the virtual world with digital identities that possess strong interactivity and engagement. Technology constructs a new virtual-real integrated environment that provides immersive experiential services and serves as a connection hub for human digital integration. Technological transformation inevitably triggers changes in human cognition, attitudes, and behavioral patterns, representing a manifestation of media affordance. The Metaverse is a digital world capable of carrying the economic, cultural, and social activities of physical space. To truly integrate into the Metaverse, individuals must find technological connection points, transforming into digital thinking for immersive experiences whether online or offline. In the future era of human-machine integration and universal connectivity, personal digitalization will deepen further, enabling everyone to independently create and apply content. This requires individuals to transform their thinking and attitudes, actively accepting and adapting to technological upgrades and iterations with positive agency. After such transformations in thinking and attitudes, personal behavioral patterns will undergo digital reconstruction, forming novel information consumption experiences.

In the Metaverse, everyone can obtain a virtual digital identity distinct from their real-world identity and acquire different life experiences through participation. Virtual digital humans will be familiar to everyone in the Metaverse era—they are native inhabitants of the Metaverse that integrate visual, auditory, and tactile experiences, serving as carriers of digital virtual identity and as a key to understanding the Metaverse. As Zhang Xinru notes, virtual digital humans can conduct real-time human body measurements, complete daily communication, and highlight personalized characteristic advantages [3]. Individuals need to acquire equipment to obtain their digital identity, reconstructing their self-identity through continuous cognition. The Metaverse forms correspondence and integration with the real world through virtual mirroring. In this integration process, virtual technological means serve as an important bridge, while humans are active participants as the main agents. The underlying logic of the Metaverse is material connection and spiritual 贯通 (penetration/continuity), encompassing real-world content but not limited to physical space. The absolute idealization of technology is the Metaverse itself. Technology continuously promotes the extension of physical space into virtual space, breaking barriers and boundaries between them, making them both independent and interdependent.

1.3 The Metaverse' s Practical Significance and Value The Metaverse not only expands human visual, auditory, and tactile senses but also extends human existence from physical space to the virtual world. In a virtual-real integrated environment, blockchain technology builds economic systems, cloud computing decrypts complex algorithms, virtual reality technology expands cognitive experiences, and digital twins enhance social interaction systems. The future development of the Metaverse will extend to broader fields such as commerce, education, social interaction, tourism, and art. Currently, academic attention to Metaverse practical applications primarily focuses on the development of embodied experience products and services. Wang Jinwei proposes that in the Metaverse, human self-identity becomes alienated, with the main focus being on creating immersive interactive experiences, where subjects can co-create long-term value for tourism resources [4]. Hua Zixun states that the "Educational Metaverse" is an immersive teaching interaction field that primarily constructs digital identities for teachers and students [5]. Hu Zhe believes that the Metaverse in gaming is a world that allows open creation, exploratory experience, and virtual transactions, which can connect with the real world to complete human-computer and human-human interaction experiences [6]. Not only academia but also industry has preliminary visions for Metaverse applications. Due to commercial profit motives, industry' s practical understanding of the Metaverse focuses more on its market commercial value, considering how to better connect users and enterprises and build more complete infrastructure to create more interactive and creative platforms.

2. Practical Research on the Metaverse in the Journalism and Communication Industry

As an important driving force in scientific development research, academia plays a crucial role in theoretical innovation and improvement. Journalism and communication scholars have gradually begun research on the Metaverse' s application in the industry. Through literature review, such research primarily concentrates on four aspects: media, content, technology, and users.

2.1 Transforming Media Thinking to Deeply Connect the Virtual World The Metaverse world can bridge online and offline spaces, enabling positive communication and interaction between them. With the rapid development of the internet, media channels for information acquisition have become more diverse, and communication methods more innovative, accumulating experience and skills in collecting, writing, editing, and publishing in virtual spaces. The core of the Metaverse is connecting virtual and real worlds and extending physical space through technological means, breaking boundaries between virtual and physical spaces. In news production and dissemination, media must transform their thinking patterns, not only deeply exploring factual content from real society but also thoroughly understanding production activities in virtual spaces to produce more humanized and distinctive news content. Dai Yuchu mentions that, both conceptually and in terms of resource integration, media

organizations need transcendent thinking to connect the virtual and real worlds [7]. Du Junfei believes that online events originate from real-world conflicts, with virtual society appeals directly pointing to physical society, indicating complex connections between virtual and real societies and representing a new social form [8]. Media institutions must grasp Metaverse development trends, improve internal development planning, and perfect top-level policy systems to better connect with the virtual world.

2.2 UGC Original Participation and Diversified Content Production

Content production in the Metaverse world is diverse and complex, involving all aspects of real social life including politics, economy, culture, and society. Virtual space is not limited to content that physically exists in physical space but consists more of scene experiences co-created by countless creators, promoting content production and value creation in the Metaverse. The Metaverse utilizes technical equipment to access virtual space, representing a comprehensive sensory extension of human hearing, touch, taste, and smell. Content production includes not only facts occurring in the material world but also intangible cultural production in the spiritual world. Du Junfei argues that people with practical significance in communication are the actual medium of virtual interaction [9], thus the Metaverse world requires rich and interesting people as media to participate in content production. As Yu Guoming states, digital media has achieved human return through recreating "digital bodies" as a new subject approach, empowering individuals as the mission of news media technology development [10]. With large-scale production and sales of virtual equipment such as AR and VR, the cost of news communication and reception has greatly decreased, promoting the progress and development of journalism. The virtual world will greatly enrich people' s spiritual and cultural life, prompting news content collection and writing to expand and produce more high-quality news reports, creating unique value and significance for news media organizations.

2.3 Advanced Technology Support to Bridge Virtual and Real Space

5G, AR, VR, and MR technologies provide support for Metaverse construction. To achieve professional and technical news reporting, news media have begun experimenting with advanced technological equipment to assist news coverage. For example, Xinhua News Agency's intelligent AR live-streaming glasses and AI-synthesized female anchors, People' s Daily' s 5G terminal equipment with VR, CCTV.com' s VR plus Vlog, and Cover News' s MR mixed-reality videos have enriched audience information acquisition methods, transcending spatial-temporal limitations, shortening the distance between communicators and audiences, and enhancing realistic experiences. Peng Lan believes that future artificial intelligence applications may develop three models: "machine-assisted," "human-machine collaboration," and "human-machine integration" [11], thus organic interaction between machines and humans better facilitates connections between real and virtual spaces. Guo Quanzhong defines intelligent media as a self-reinforcing ecosystem based on big data, mobile internet, virtual

reality, and human-computer interaction technologies, achieving a media form that matches information with users [12]. Regarding virtual-real interaction, the Metaverse relies on technology to continuously seek breakthroughs. Wu Jiang states that XR integrates VR, AR, MR, and other technologies to establish communication channels between the brain and external devices, breaking boundaries between real and virtual spaces [13]. This requires continuous technological iteration and upgrading to make news reporting an important bridge connecting real and virtual spaces.

2.4 Emphasizing User Participation to Produce Perceptible News

The Metaverse immerses people in experiences that generate a sense of participation and engagement. Through prolonged contact and authentic interactive experiences, people may develop strong emotional attachment and psychological belonging to the virtual world. In the Metaverse, news content production can utilize algorithmic recommendation technology to more accurately capture user needs while providing personalized information services based on user preferences, reducing information acquisition costs and aiming to improve communication efficiency. Wu Jiang mentions that the Metaverse, relying on virtual reality technology, emphasizes immersive interactive experiences. This "what you think is what you get" brain-computer interaction can blur people' s sense of boundaries between real and virtual, potentially causing emotional belonging deficits [14]. In the era of intelligent media, the Metaverse world emphasizes user experience and participation, which largely relates to communication research' s focus on the bodily return of humans. As Peng Lan states, in the current ecological environment, bodily practice has become a representation of human-computer interaction [14]. In the future, to better facilitate user participation in news content production, dissemination, and consumption processes with digital identities, news media must provide high-scenario services, emphasize the news production process, and produce information content rich in experiential quality [15].

3. The Impact of Metaverse Thinking on the Future Development of Journalism

Metaverse research is still in its early stages, and the concept currently lacks a recognized, authoritative, and clear definition. In journalism and communication academia, scholars are actively engaged in Metaverse-related research, deeply exploring its impact on the industry' s future development. However, amidst the currently unavoidable hype bubble and construction boom, rational thinking about Metaverse development is necessary to avoid falling into narrow-minded thinking pitfalls. Metaverse thinking poses higher demands and innovative standards for journalism and communication industry development.

First, while emphasizing technological application, journalism must not become overly reliant on technological rendering; news reporting in the Metaverse environment should still prioritize content. The application effects of Metaverse

technology make the virtual world increasingly approximate the real world, making the boundary between real and virtual increasingly blurred. Technological innovation is an important driving force for journalism development, holding significant meaning and value. However, news production cannot blindly showcase technology while neglecting content creation. Journalism must still adhere to the principle of "content is king," making quality content production the foundation of media survival and development. In the Metaverse world, media institutions must deeply understand the operational logic of the virtual world, whether events occur in virtual or real society, and continuously approach the truth behind facts. Establishing themselves with "content as king" helps enhance media credibility and influence. Technology application should present content in forms that audiences can more easily understand and perceive, never overshadowing the main content.

Second, the Metaverse is committed to meeting users' spiritual needs, and journalism development cannot depart from media social responsibility. In the mobile internet era, audiences have diversified channels for receiving information. To better capture audience attention, media must adhere to the "audience-oriented" concept, satisfying diverse information needs and providing personalized information services. However, news media institutions, as "social instruments"and societal watchdogs, bear responsibility not only for producing quality news content but also for cultural resource inheritance and protection. In the Metaverse environment, media institutions must innovate their thinking, using advanced technology to rejuvenate traditional culture with new vitality. For example, Henan Satellite TV' s 2021 programs "Dragon Boat Festival Fantasy Night," "Tang Palace Night Banquet," and "Lantern Festival Fantasy Night" cleverly combined traditional Chinese culture with modern technology, earning excellent audience reception through this "traditional culture + modern civilization" approach.

Third, under Metaverse thinking, journalism and communication academia should continuously strengthen the integration of Metaverse practical research with media industry layout. While using Metaverse thinking to build media industry chains, they should also use Metaverse media industry practice to advance in-depth research on Metaverse information communication-related influencing factors. To better welcome the arrival of the Metaverse, future journalism industry development must 打通 (open up) communication and interaction between academia and industry, forming a benign closed loop of Metaverse industry-academia development.

Finally, the journalism industry must cultivate professional talent teams under Metaverse thinking. In the Metaverse context, traditional skills in collecting, writing, editing, and publishing can no longer fully meet the requirements of the new era of information communication. Journalism practitioners need to continuously innovate their creative thinking, master advanced virtual reality technologies, and become versatile creative talents. For educational institutions, cultivating professional journalism talent requires not only improving teaching

quality but also forming effective supply-demand 对接 (connections) with news organizations, allowing theory to serve practice and better support talent development. For news organizations, strengthening professional knowledge and technology application training for practitioners, improving institutional assessment and reward systems, and enhancing practitioners' enthusiasm for learning and applying new technologies will enable them to produce more valuable and meaningful news content through human-machine interaction.

The Metaverse presents both opportunities and challenges for journalism development. In the Metaverse environment, the journalism industry should innovate development ideas with Metaverse thinking, keep pace with the times, use technology to promote effective transformation between virtual and real spaces in news communication, prioritize users to enhance their news information experience, create market-adaptable media industry chains with Metaverse innovative thinking, and cultivate professional talent teams with market adaptability and application skills through talent mechanism innovation.

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(Responsible Editor: Li Jing)

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