Exploring AI-Driven Paradigm Innovation in International Communication: Postprint

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Abstract

Objective: To investigate the role of artificial intelligence (AI) in enhancing communication effectiveness, promoting cultural exchange, facilitating public opinion management, and reconstructing communication paradigms.

Methods: Through case analysis and literature review, this study examines how AI optimizes communication strategies and enhances information visibility via data analysis and machine learning, and how VR and AR technologies provide immersive experiences to deepen cultural understanding and exchange.

Results: The findings indicate that AI application significantly enhances the efficiency of news communication and fosters mutual understanding and respect among different cultures. Moreover, AI has propelled paradigm innovation in communication, manifested specifically through the diversification of communication agents, transformation of communication fields, and reconstruction of communication order.

Conclusion: AI has engendered revolutionary transformations in the field of news communication, not only augmenting the speed and breadth of information transmission but also strengthening cross-cultural communication. Future endeavors should continue to explore AI's potential to lay the groundwork for more open and inclusive global dialogue.

Full Text

Preamble

Artificial Intelligence-Driven Innovation in International Communication Paradigms

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Abstract

This study explores the role of artificial intelligence (AI) in enhancing communication effectiveness, promoting cultural exchange, facilitating public opinion management, and reconstructing communication paradigms. Through case analysis and literature review, we examine how AI optimizes communication strategies via data analytics and machine learning to enhance information visibility, and how VR and AR technologies provide immersive experiences that deepen cultural understanding and exchange. The findings demonstrate that AI application significantly improves the efficiency of news communication and fosters mutual understanding and respect among different cultures. Moreover, AI drives paradigm innovation in communication, manifested through diversified communication subjects, transformed communication fields, and reconstructed communication order. In conclusion, AI has brought revolutionary changes to journalism and communication, not only accelerating the speed and breadth of information transmission but also strengthening cross-cultural communication. Future research should continue exploring AI's potential to lay foundations for more open and inclusive global dialogue.

Keywords: news communication; communication paradigm; international communication; artificial intelligence; metaverse

1. AI's Multidimensional Impact on International Communication

1.1 Enhancing Communication Effectiveness

AI can precisely comprehend audience needs and preferences through data analysis and machine learning. For instance, media organizations such as newspapers can analyze social media data to identify interest points among audiences from specific cultural backgrounds, thereby customizing communication strategies and delivering more targeted content to increase both information reception rates and audience engagement. AI-powered automation tools can rapidly generate and translate information, enabling faster and broader global dissemination of communication content. Real-time translation, for example, allows audiences from different regions and countries to receive information instantly, eliminating language barriers, enhancing international communication and understanding, breaking down cultural barriers, and promoting cooperation and exchange among nations [1]. Furthermore, AI-based content recommendation systems can effectively improve information visibility. Through algorithmic optimization, these systems ensure that important issues receive timely and widespread dissemination, thereby influencing public opinion. In summary, the scientific application of AI can enhance the efficiency and effectiveness of international communication, providing strong support for promoting global exchange.

1.2 Promoting Cultural Exchange

AI also plays a significant role in facilitating cultural exchange. For example, image recognition technology in AI can multi-dimensionally analyze and tag cultural artworks, enabling non-native audiences to understand their underlying cultural connotations. By deepening audience comprehension and appreciation of cultural works, AI promotes dialogue between different cultures. Additionally, AI can leverage VR and AR to provide more immersive cultural exchange experiences, allowing users not only to "enter" other cultures but also to participate personally and experience firsthand the profound heritage of other cultures. Through vivid experiential forms, AI eliminates cultural differences and enables users from various countries to enhance mutual understanding and respect through interaction, further promoting global cultural diversity and inclusivity. AI's role in content creation should not be underestimated either. Flexible application of this technology can promote integration and innovation among cultures. For instance, artists and creators from various countries can use AI to generate novel artistic works, thereby creating new cultural forms. In this process, AI exists not merely as a tool but also serves as a catalyst, continuously promoting mutual learning and reference among global cultures and accelerating the pace of cultural integration and development [2].

1.3 Facilitating Public Opinion Management

In today's era of information explosion, public opinion management is crucial for international relations and communication strategies. AI can effectively monitor and manage global public opinion dynamics, helping government departments identify and scientifically respond to potential public opinion crises in a timely manner. Natural language processing can analyze social media and news reports to promptly detect public reactions to specific events, providing early warnings of destabilizing factors and enabling decision-makers to take swift measures to mitigate adverse effects and safeguard national image and diplomatic relations. Public opinion analysis tools can help media organizations such as newspapers understand the characteristics of public opinion in different cultures and countries, thereby optimizing communication strategies and enhancing the relevance and effectiveness of international communication activities to ensure smooth information transmission and reception. Moreover, research finds that audiences are more likely to trust AI-based data analysis and recommendations because AI analysis results are less affected by personal emotions or biases. This indirectly demonstrates that applying transparent and objective AI to news communication can help media organizations gain audience trust, thereby enhancing audience belonging to the nation, building more stable international relations, and promoting cooperation and development among countries.

2. Paradigm Shifts in International Communication

2.1 Diversification of Communication Subjects

A subject refers to a self-aware individual capable of independent thinking, perception, and action. The criterion for determining whether an entity is a subject lies primarily in whether it can conduct practical activities based on conclusions drawn from its own thinking and whether such activities can influence the external environment [3]. Before the advent of AI, machines merely served as equipment and tools, lacking autonomous thinking capabilities and unable to independently complete communication practice activities. In the AI era, strong artificial intelligence (AGI) is gradually replacing weak artificial intelligence (ANI), endowing machines with the conditions to become communication subjects. ANI is technology that executes and completes preset tasks based on rule instructions. Although this technology can simulate human intelligence, its learning, thinking, and reasoning capabilities are relatively weak, requiring human supervision and intervention to make correct decisions and complete tasks. It is important to clarify that even though ANI can only simulate basic forms of human intelligence through behavior, symbols, and connection logic, the similarity between machine intelligence and human intelligence is continuously increasing with technological development, indirectly indicating that ANI will play an important role in communication activities in the future. Consequently, AGI will further elevate its position in journalism and communication in the future. The main difference between AGI and the aforementioned ANI is that the former can learn human thinking patterns, think independently, reason, and make judgments. As technology possessing correct values, worldviews, and personal emotions, AGI can not only efficiently complete conventional human intelligence activities but also help humans expand their capability boundaries, enabling them to accomplish difficult tasks beyond their capacity. In the new era, the gap between machine and human intelligence is further narrowing. Both virtual digital humans with perception and interaction capabilities and social robots with social and interactive capabilities are widely used in society. As the degree of human-machine integration deepens, news transmission through human + nature, human + human, machine + machine, and machine + human will become the norm. Under this communication paradigm, the relationship between machines and humans is no longer the traditional subject-object relationship; instead, as independent entities, their relationship changes with the context [4].

2.2 Transformation of Communication Fields

The metaverse is a digital medium connecting virtual and real worlds, encompassing both mature existing technologies and future innovative technologies. In recent years, the digital spatial structure has undergone multiple reconstructions due to the influence of the metaverse. In terms of time, AI has accelerated the arrival of a conceptual revolution in time. The concept of time has experienced three transformations since its inception, sequentially being natural time,

mechanical time, and media time. In the AI era, the characteristics of media time—fragmentation, disorder, and instantaneousness—are infinitely amplified. The existence of consciousness and brain-computer interface technologies provides support for humans to deconstruct and reconstruct time based on the internal logic of media [5]. In terms of space, AI can not only expand the boundaries of physical space but also facilitate spatial superposition. AI's digital twin technology can establish mathematical models and conduct simulations to completely map the entire process from birth to demise of specific systems or objects, helping humans understand the development laws followed by today's society. Meanwhile, the emergence of XR has broken the long-standing operational rules of the real world, accelerating the integration of virtual and real worlds. Humans in artificial real scenes will rely on multiple digital spaces to construct new meta-realms with personalized and effective characteristics, making inspired ideas become reality [6]. In summary, the metaverse has become the main field of international communication, providing support for humans to break through the limitations of physical time and space, enabling international communication to achieve the ultimate goal of digital survival by constructing new digital avatars using digital images as carriers.

2.3 Reconstruction of Communication Order

The advent of AI has reconstructed the order of information dissemination, with significant changes occurring in power structures, information production, and communication. Analysis of power structures reveals that digital infrastructure and data play irreplaceable roles in communication games. The influence of values conveyed by information and national ideological cohesion on international discourse power is gradually becoming apparent [7]. The transformation of media fields is also prominent, with the metaverse based on digital infrastructure gradually replacing original communication fields, affecting not only traditional media such as radio, television, and newspapers but also reducing the status of new media represented by the Internet. Communication subjects have extended from human individuals to humans + artificial intelligence, with all these subjects playing important roles in the information dissemination process. The birth of AI and brain-computer technology has accelerated human breakthroughs beyond limitations imposed by media techniques, language, and knowledge levels, making it possible to directly transform ideas carried by brain signals into multimodal information. Moreover, changes in information flow should also be noted. AI has deepened the integration of machine intelligence, the physical world, and human society. The emergence of intelligent algorithms represented by digital algorithms has enabled communication mechanisms to smoothly transform from vertical to flat structures, with communication order changing from top-down to bottom-up and communication scope significantly expanding compared to before [8]. This demonstrates that the information dissemination order has undergone obvious changes in the AI era, which deserves attention.

2.4 Enhanced Competitive Advantages in Communication

In the AI era, the composition of material foundations has changed, with the status of digital infrastructure continuously rising. Data generated by such infrastructure generally possesses economic and political values that cannot be ignored. Consequently, digital infrastructure has become a bargaining chip in communication competition and, to some extent, determines the final outcome of news communication games. Research finds that major countries worldwide have increased their emphasis on digital infrastructure in recent years, formulating new strategic layouts based on actual conditions, with the complexity of the competitive landscape subsequently increasing. First, infrastructure construction directly affects the effectiveness of information dissemination. Countries with advanced infrastructure can disseminate information faster and more widely, influencing international public opinion. For example, the popularization of 5G has enabled new communication methods such as video live streaming and online meetings, allowing media organizations to showcase their image and viewpoints through these technologies and thereby expand their discourse power globally. Second, data acquisition and utilization have become new battlegrounds for competition among nations. Data is not only an important driving force for economic development but also an essential component of public opinion and national security. Relevant institutions can formulate policies and communication strategies more accurately through data mastery and analysis. In the field of international relations, for instance, data's role is to demonstrate other countries' public opinion dynamics and popular trends, thereby gaining more international support for the nation. Furthermore, advancements in data analysis technology have greatly improved the personalization and precision of information dissemination. Relevant institutions can formulate and implement communication plans based on the psychology and needs of specific target groups, thereby expanding influence. It must be specially noted that data usage often involves ethical and security issues. Information abuse and privacy leakage are challenges that must be faced in the digital age. Therefore, in the context of international communication, relevant institutions need to handle data issues cautiously to ensure compliance and security in information dissemination and avoid unnecessary international disputes. In summary, in the new era, countries that can flexibly utilize digital technology and data will occupy advantageous positions in international communication competition. The importance of digital infrastructure in communication is increasingly prominent. Therefore, relevant departments must not only increase emphasis on infrastructure construction and build open, shared, and secure infrastructure and data governance models but also explore scientific and rational paths for data utilization to enhance communication effectiveness.

2.5 Fulfillment of Human Needs

The essence of media development is a process of biological fission and evolution, whose function is to provide channels for humans to enter new fields and partic-

ipate in new activities. At present, media is undergoing evolution from radio, television, and newspapers to the Internet and then to the metaverse. Human perception and measurement of all things in society are constantly changing due to technological development. Consequently, the form of AI with ideal learning and cognitive abilities that can independently execute specific tasks has become more complex. Correspondingly, humans will also break through their biological limitations with the assistance of intelligent media and regain nature [10]. The original intention of human research on AI is to create intelligent agents with ideal cognition, learning, decision-making, and execution capabilities that align with human society's moral concepts, emotions, and ethics. From a communication perspective, AI can rapidly generate audio-visual, pictorial, and textual reports based on massive data and algorithmic models, providing audiences with good viewing experiences and increasing their depth of understanding of report content by establishing personalized, contextualized, and customized models [11]. With technological progress, the conversion speed between digital signals relied upon by computers and electrical signals relied upon by human brains will further increase, making barrier-free communication highly probable. Simultaneously, service models will transform from conventional user-driven to adaptive services, fully satisfying human needs at the value, sensory, and emotional levels.

3. Exploration and Achievements of AI+ News Communication

3.1 Technical Implementation

3.1.1 Host Configuration Since the work of generating and training virtual anchors imposes extremely strict requirements on computer performance, staff at Luoyang Daily News upgraded the configuration of existing computers according to the needs of AI experiments. By increasing storage capacity and enhancing computing power, they enabled smooth progress in data processing, model training, and other tasks, providing support for AI application.

3.1.2 GPU Acquisition To enhance graphics processing capabilities, staff purchased specialized graphics cards adept at handling video images with extremely high frame rates and output resolutions, making the visual effects of generated virtual anchors more realistic. With virtual anchors capable of broadcasting news naturally, vividly, and smoothly, the audience experience of watching news programs was optimized.

3.1.3 Voice Model Training Voice, as a key component of virtual anchors, has a decisive impact on whether virtual anchors can fully perform their functions. To improve voice quality and optimize voice effects, staff established voice models based on the principles and requirements of speech synthesis. They first collected multiple voice samples through various channels, analyzing the speech

rate, timbre, and intonation of different samples to ensure the established models could endow virtual anchors with rich and varied voices that maximally satisfy the needs of news broadcasting [12]. After completing the aforementioned work, they trained and optimized the models based on deep learning algorithms, enabling the models to quickly extract and master the pronunciation characteristics of real anchors and ensuring virtual anchors could broadcast news fluently and naturally.

3.1.4 Video Model Fine-Tuning Staff adjusted the video generation model, establishing a model capable of changing lip shapes according to voice signals and lip movement correlations. A lip-reading recognition model predicts input speech and synchronizes predictions to the system, which generates smooth lip animation in real-time based on model predictions, controlling virtual anchors to complete news broadcasting tasks [13]. In actual work, relevant personnel further improved the matching degree between lip shapes and news broadcasting rhythm and pronunciation by adjusting core model parameters, ensuring that the virtual anchor's voice and lip shapes remain synchronized at all times. Combined with natural facial movements, this enhanced the realism of news broadcast by virtual anchors. Additionally, staff adjusted the clothing worn by virtual anchors based on news themes and scenes, strengthening the video atmosphere while meeting reporting requirements.

3.2 Application Achievements

3.2.1 Launching Multiple Virtual Anchors The newspaper has successively launched seven virtual anchors with distinctive personal characteristics, different broadcasting styles, and prominent image features, responsible for reporting news on the World Youth Cycling Championships, World Hakka Conference, and Classical Studies Conference. During news broadcasting, virtual anchors have received audience praise for their vivid and professional performances. This demonstrates that virtual anchors can not only accurately and timely convey news content but also endow news with stronger appeal and attraction through flexible body movements and rich facial expressions, enabling rapid news dissemination.

3.2.2 Enriching News Broadcasting Languages To fully meet the needs of international events, newspaper staff also upgraded the capabilities of virtual anchors, making it possible for them to broadcast different news in different languages. During events, the newspaper's virtual anchors broadcast the same news in Chinese, English, and other languages, ensuring that audiences from different regions and countries could timely understand event progress while expanding the communication scope and enhancing Luoyang's influence and visibility [14].

3.2.3 Improving News Broadcasting Efficiency Compared with real anchors, the advantage of virtual anchors lies in their freedom from temporal and

spatial constraints, enabling 24-hour continuous news broadcasting. After the opening of events such as the World Youth Championships and World Hakka Conference, virtual anchors switched to 24-hour work mode, accurately and timely broadcasting event progress and competition results, effectively improving the quality of information services and enhancing audience stickiness. Taking the Classical Studies Conference as an example, the newspaper released 25 pieces of information about the event through multiple overseas social platforms including TikTok and X via Luoyang Net, enhancing the event's international influence [15].

3.2.4 Creating an International Version of Luoyang Net The international version of Luoyang Net was officially launched in 2024. The website features five distinctive news channels and supports eight languages including English, French, and German, effectively eliminating barriers caused by language differences. This enables overseas users to access information simply and timely, providing support for cross-cultural international exchange.

Conclusion

In summary, the advent of AI has accelerated the pace of paradigm innovation in communication. At present, Luoyang Daily News has mastered the method of applying AI to create virtual anchors, injecting vitality into news dissemination. By broadening the boundaries and channels of news communication, communication effectiveness has been significantly enhanced. Given that AI is both technical and professional, to further leverage AI's driving role in the newspaper's development, three tasks should be fully implemented in the future: First, increase efforts to introduce and cultivate talents with solid knowledge foundations and outstanding professional skills to provide talent support for the newspaper; second, optimize the video and voice models supporting virtual anchors to make them more realistic and natural; and third, implement intelligent management of virtual anchors to enhance their adaptability to news communication needs and broadcasting scenarios. Thereby, Luoyang's influence in the international community can be enhanced.

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Author Biography

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Note: Figure translations are in progress. See original paper for figures.