

Technology Empowerment and Cultural Translation: A Study on the International Communication Pathways of Broadcasting and Hosting to Tell China's Technological Innovation Stories in the AI Era

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ABSTRACT

This paper focuses on the international communication practices of broadcasting and hosting in the AI era, with "technology empowerment" and "cultural translation" as its core. Through case analysis, it examines their achievements and challenges in telling China's technological innovation stories well, and constructs a three-dimensional strategic framework of "intelligent communication-narrative translation-human-machine collaboration". The study indicates that enhancing communication efficiency through AI is essential to resolve cultural discount via accessible expression, while leveraging human-machine collaboration to balance technological advancement with humanistic warmth, providing references for strengthening the international influence of China's technological narratives.

KEYWORDS

AI era; Broadcasting and hosting; China's technological innovation stories; International communication; Cultural translation

1 Introduction

As the competition for global technological dominance intensifies, although China's innovative achievements in fields such as high-speed rail, 5G, and aerospace demonstrate the country's strength, its international recognition is disconnected from its actual influence. Traditional broadcasting and hosting, due to inefficient multilingual production and insufficient cultural adaptation, struggle to break through communication barriers.

Meanwhile, AI technologies such as speech synthesis and virtual digital humans are reshaping the industry landscape. The practices of the China Media Group's "AI WangGuan" and CGTN's multilingual AI hosts have verified their value in enhancing communication efficiency and expanding coverage. Against this backdrop, how to leverage AI technology to break through efficiency bottlenecks, resolve cognitive barriers through cultural translation, and enable broadcasting and hosting to more effectively convey China's technological innovation stories to the international community has become a key issue.

2 Research Background and Literature Review

2.1 Research Background and Significance

At the technical level, AI technologies such as speech synthesis and virtual digital humans are profoundly reshaping the broadcasting and hosting industry. Projects like the "AI WangGuan" of China Media Group have achieved content production lightweight through digital avatars, providing new tools for international communication that reduce costs and increase efficiency, and solving the problems of long production cycles and high costs of traditional multilingual content production.

From the perspective of practical needs, there is a disconnection between the international recognition and actual influence of China's major scientific and technological innovation achievements such as high-speed rail, 5G, and aerospace. Traditional broadcasting and communication strategies are difficult to meet the needs of international audiences. The cultivation of international communication broadcasting and hosting talents should establish the concept of "differentiated communication", seek the points of convergence between Chinese culture and international culture, and communicate in accordance with the values generally recognized by the world ^[1]. The application of AI technology in areas such as multilingual conversion provides the possibility of making up for communication deficiencies.

This research can not only specifically solve core pain points such as "difficulty in converting technical terms" and "misunderstandings caused by cultural differences", providing theoretical support for practice; but also explore the deep integration path of AI and broadcasting and hosting, helping to improve the quality and efficiency of the international communication of China's scientific and technological innovation stories.

2.2 Domestic and Foreign Research Status

2.2.1 Domestic Research

Domestic research mainly focuses on the technical application of AI in the broadcasting field. AI anchors are application systems developed under the leadership of artificial intelligence technology, in collaboration with algorithm programs, and by utilizing various high-precision technologies such as voice synthesis engines and image synthesis engines^[2]. For instance, the smart voice broadcasting services launched by the CCTV News App and Xinhua News App, as well as the AI synthetic anchors "Xin Xiaohao" and "Xin Xiaomeng" jointly introduced by Sogou and Xinhua News Agency. However, domestic research lacks integrated studies on "technology tools + cultural translation + international communication", and pays insufficient attention to the specialized dissemination of science and technology stories.

2.2.2 Foreign Research

Foreign research emphasizes the improvement of cross-cultural communication efficiency driven by AI. Some studies have examined the AI-enabled mechanisms of short-video platforms like TikTok and YouTube, finding that AI recommendation algorithms can precisely target the audience, and intelligent translation and localization strategies can enhance the international adaptability of local cultural content. However, the AI-driven communication system still faces issues such as the "information cocoon", cultural adaptation differences, and algorithmic bias^[3]. Nevertheless, there are very few studies that specifically analyze the narrative logic and communication strategies of "Chinese scientific and technological innovation stories", and there is a lack of regional specificity.

In summary, domestic research lacks integrated studies on "technology + culture + international communication", and there are frequent failures in cultural translation in AI broadcasting in international communication. Foreign research lacks specialized analysis of Chinese stories of scientific and technological innovation, and domestic practices lack differentiated references, further exacerbating the imbalance in technology application and other issues.

3 Core Concept Definition and Theoretical Basis

3.1 Core Concept Definition

3.1.1 AI Era Broadcasting and Hosting

The new form of broadcasting and hosting after the deep integration of AI technology mainly falls into two categories: one is "AI-generated anchors", which are completely AI-driven virtual broadcasting subjects. For example, the digital doppelgänger of CGTN hosts can achieve multi-language broadcasting and 24-hour continuous output, with the core being standardized content production empowered by technology; the other is the "human hosting + AI assistance" model, where humans lead emotional expression and narrative logic, and AI undertakes basic tasks such as real-time subtitle translation, voice adaptation, and data broadcasting, forming a human-machine collaborative communication pattern.

3.1.2 Chinese Stories of Scientific and Technological Innovation

This study focuses on three core narrative themes:

(1) Hard-core technological breakthroughs: such as narratives of cutting-edge achievements in quantum computing, ultra-high voltage power transmission, and 5G core technologies.

(2) Technology benefiting the people: such as application cases of AI smart agriculture, drone disaster relief, and digital healthcare that are close to people's livelihood.

(3) The spirit of scientific researchers: such as the stories of research teams overcoming difficulties, cross-disciplinary collaboration, and serving the country through science and technology.

3.1.3 Cultural Translation

Combining the cultural background and cognitive habits of the target audience, transforming professional terms, technical logic, and value concepts in China's scientific and technological field into understandable and relatable narrative frameworks, the core is "re-creation" to reduce "cultural discount", rather than simple translation. For example, "blockchain" is analogized as "an unalterable digital ledger", and "ultra-high voltage power transmission" as "electricity highways", helping audiences from different cultures understand the core information.

3.2 Theoretical Support

3.2.1 Technology Acceptance Model (TAM)

This model analyzes the acceptance of AI broadcasting forms by international audiences through two dimensions:

"perceived usefulness (PU)" and "perceived ease of use (PEOU)", clarifying the boundaries of technology application. In practice, strategies are optimized based on audience feedback, such as adjusting the broadcasting speed and explanation of terms based on the feedback of Russian audiences on AI multilingual technology broadcasts.

This model will run through the subsequent analysis - in the issue of "imbalance in technology application", it explains the reasons why audiences abandon AI broadcasting through "perceived ease of use"; in the "scenario-based content generation" strategy, it designs content based on "perceived usefulness" to further optimize the acceptance of Chinese scientific and technological content by international audiences.

3.2.2 Cross-cultural Communication Theory

Combining Hofstede's "cultural dimensions theory" and the "individualism and collectivism" dimension, it adapts to the narrative preferences of audiences in different countries. For individualistic cultures such as Europe and America, it highlights the personal breakthroughs of researchers; for collectivist cultures such as East Asia, it emphasizes the achievements of team collaboration. At the same time, it guides the broadcasting tone - for low-context cultures such as Europe and America, it adopts straightforward expression; for high-context cultures such as Southeast Asia, it uses scenario-based hints to evoke resonance.

The "cultural translation strategy" will deeply apply this theory, such as designing a narrative of "community sharing of scientific and technological achievements" for African collectivist cultures and a story of "individual breakthroughs of researchers" for Western and European individualist cultures, to ensure that the strategy is based on theoretical grounds.

4 Analysis of the Current Situation of Telling Stories of China's Technological Innovation in the AI Era by Broadcasters and Hosts

4.1 Practical Achievements: Enhanced Communication Efficiency Empowered by AI

4.1.1 Technological Application Breakthroughs

AI technology has brought about key breakthroughs for broadcasters and hosts in communicating stories of technological innovation in China, significantly enhancing multilingual adaptation and production efficiency. CGTN's AI virtual anchors have achieved real-time broadcasting in 12 languages including English and Spanish, covering countries along the "Belt and Road" and many other regions around the world. The China Media Group has shortened the production time of AI-hosted technology news from 2 hours to 5 minutes by relying on its own AI technology, and completed the production and release of nearly 100 technology-related videos in 10 languages within a week. Meanwhile, the "one-time production, multi-platform adaptation" technology of AI can automatically generate content suitable for both YouTube long videos and TikTok short videos, improving communication efficiency.

4.1.2 Innovation in Narrative Form

The combination of "scenarization and lightweighting" makes the technological narratives of AI broadcasting more vivid. Different practices in various communication scenarios have their own highlights, providing multiple paths for AI-era broadcasting and hosting to tell the story of China's technological innovation to the international community. In local media, the AI virtual anchor of Baoying County uses the rice field as the real scene and presents the application of intelligent monitoring technology in the field from the first-person perspective, turning the principle of sensors into a visual operation scene. On short-video platforms, the AI anchor "Xiao Ke" on Douyin uses animations to disassemble the structure of the space station and the experimental process, and combines it with colloquial explanations. A single video has received over 5 million views overseas.

In the context of international communication, the narrative innovation of AI broadcasting is even more valuable. For instance, the virtual AI anchor Gu Xiaoyu of Zhejiang Satellite TV, as a cultural promotion ambassador, has launched the program "Xiao Yu Sees China" on overseas platforms such as TikTok and YouTube, interpreting the integration of Chinese science and technology with culture in the form of lightweight short videos, building a communication bridge for overseas audiences and expanding the international coverage of China's technological innovation stories.

4.1.3 Expansion of Communication Coverage

AI helps broadcasting and hosting break through the boundaries of traditional communication, achieving bidirectional coverage expansion. On the one hand, AI anchors distribute technological content to overseas platforms such as YouTube and TikTok, precisely reaching the core young audience aged 18 to 35, confirming the high attention of this group overseas. On the other hand, for regions with weak traditional communication, such as the Middle East and Latin America, AI broadcasting in local languages is used to customize content. For example, the AI digital person "Tayengge" in Burmese and "Kamp" in Lao, created by the International Communication Center for South and Southeast Asia in Yunnan Province,

broadcast China's technological developments in local languages. After promotion on overseas social media, the response was enthusiastic, effectively enhancing the global penetration rate of China's technological innovation stories.

4.2 Existing Issues: Shortcomings Constraining AI Broadcasting and Hosting

4.2.1 Imbalance in Technology Application and Ethical Risks

When AI broadcasters are used to tell stories about technological innovations, the problem of technological imbalance is particularly prominent. In some scenarios, there is an excessive reliance on AI anchors, resulting in a lack of emotional expression and an inability to convey the value and appeal of technological breakthroughs. Research by third-party institutions shows that, from the perspective of the Technology Acceptance Model (TAM), 68% of users abandon watching because the AI anchors have a "flat tone", failing to meet the requirement of "perceived ease of use" - audiences have to spend more effort to understand the content and cannot enhance acceptance through emotional resonance, which also leads to a decrease in completion rates. Moreover, some content blindly adds special effects for the sake of technological gimmicks, resulting in problems such as the jumbled and piled-up dynamic data charts, seriously interfering with the transmission of core technological information.

The absence of ethical considerations is also a cause for concern. Currently, most AI anchors still have problems such as stiff expressions and mechanical intonations, making it difficult to establish an emotional connection with the audience and directly reducing the credibility of the content. More importantly, the industry has not yet established a complete ethical review mechanism for AI broadcasting content. The content generated by AI may contain value biases, and once it is spread, it not only misleads the audience but also incurs extremely high costs for subsequent corrections.

4.2.2 Insufficient Cultural Transliteration and Monotonous Narrative Perspective

The lack of cultural adaptation and narrative limitations restrict the international resonance of AI broadcasting content. In terms of cultural transliteration, many professional terms such as "ultra-high voltage transmission" and "quantum entanglement" are directly translated, causing the AI translation model to frequently "fail" when dealing with culturally loaded expressions. A study on 20 languages shows that among 87 AI-translated samples of technological content containing cultural metaphors, only 31% successfully conveyed the intended meaning. For instance, in English technology reports, the phrase "cat's meow" (meaning "excellent") was mistranslated into German as "katzenjammer", which has a connotation of "sadness", deviating from the positive context of technology dissemination. Moreover, AI-broadcasted technology content targeted at the Middle East market has encountered obstacles in content dissemination due to the algorithm's failure to recognize religious and cultural taboos, resulting in the inappropriate use of sensitive elements.

In terms of narrative perspective, the focus is on showcasing the achievements of "China's leading technology", lacking a common narrative of "technology solving common human problems". Observations show that over 60% of foreign AI technology news related to China centers on "achievement data", but rarely integrates regional pain points such as energy shortages in Africa and low agricultural efficiency in Southeast Asia into the content design. This single perspective limits the effectiveness of communication - data from the China Foreign Languages Publishing Administration shows that only 28% of overseas audiences can perceive "value relevant to themselves" from China's AI-broadcasted content on science and technology themes, making it difficult to form an emotional connection.

5 International Communication Strategies for Narrating China's Technological Innovation Stories in the AI Era

5.1 Technological Empowerment: Building an "AI + Broadcasting" Intelligent Communication System

5.1.1 Multi-language Intelligent Adaptation

Establish a "one-time recording + multiple language conversion" mechanism, relying on AI voice synthesis technology to achieve simultaneous multi-language conversion of Chinese science and technology content. Optimize voice styles based on the cultural habits of different languages - for example, English broadcasts emphasize stress and accelerate the rhythm to match the auditory preferences of the audience, while Japanese broadcasts have a gentle intonation and polite expression to fit the local communication context. This adaptation logic has been verified in practice - the AI virtual anchor "Xiaoyu", jointly developed by Central China Normal University and iFlytek, can accurately adapt to multiple languages such as English, Japanese, and Korean, effectively breaking the limitations of small language group communication and reaching a wider overseas audience.

5.1.2 Scene-based Content Generation

Through AI user profiling to accurately identify audience needs, customize differentiated broadcasting content: for the youth group, use "question-and-answer style broadcasting" to break down scientific principles, making complex knowledge easier to understand; for industry professionals, adopt "in-depth interview style broadcasting" to deeply analyze technical details, meeting professional cognitive needs; for the general public, use "storytelling style broadcasting" to describe the application scenarios of technology, making science and technology closer to life. At the same time, use AI 3D modeling to create virtual scenes such as "technology laboratories" and "farmland operations", allowing broadcasters to "be in the scene", enhancing the visualization effect of the content.

5.1.3 Real-time Interaction Optimization

During live broadcasts on overseas platforms, AI captures audience questions in real time through bullet comments, automatically filters out frequently asked questions, and assists human hosts in responding quickly to avoid missing the core concerns of the audience. At the same time, AI can also analyze audience behavior data in real time, such as the bounce rate and completion rate of a certain technical explanation, and feed this data back to the hosting team in real time to help them dynamically adjust the broadcast rhythm and content focus. This data-driven optimization approach has been applied in multiple AI broadcasting interaction scenarios, significantly enhancing the audience's sense of participation and content acceptance overseas.

5.2 Cultural Transliteration: Crafting a Narrative of "International Universality + Chinese Characteristics"

5.2.1 Popularization of Terminology Conversion

Establish a "Chinese Scientific and Technological Terminology Cultural Translation Database", providing vivid analogical explanations for core terms. "Blockchain" is interpreted as "an unalterable digital ledger", and "photoresist" is compared to "the foundation of a chip", making professional concepts more understandable. On this basis, AI simultaneously generates animations and diagrams to complement the voiceover explanations, helping overseas audiences grasp the connotations of complex terms through intuitive visual presentations. This "analogy + visual aid" model has been proven effective in practice for enhancing the efficiency of term interpretation.

5.2.2 Global Switching of Perspectives

The narrative perspective shifts from "China's achievements" to "global values". When broadcasting about China's technological innovation, the focus is placed on cases of international cooperation. For instance, how China's 5G technology has enabled network coverage in remote areas of Brazil, and how AI breeding technology has supported Africa in addressing food production challenges. These cases allow overseas audiences to more directly perceive the global value of China's technology. At the same time, technological stories are designed around global concerns such as "environmental protection", "people's livelihood", and "development", highlighting the solutions provided by China's technology for common human problems, precisely catering to the overseas audience's preference for "mutually beneficial" content.

5.2.3 Skillful Integration of Cultural Symbols

In the design of AI anchors' images, Chinese elements are moderately integrated, such as adding cloud patterns in the details of the costumes, which not only reflect Chinese aesthetics but also avoid seeming forced. Traditional technological symbols like the south-pointing chariot and the abacus are incorporated into the background scenes of the virtual studios, subtly conveying the connotations of Chinese culture. Moreover, during the broadcasting process, the meanings of these cultural symbols are briefly explained in 1-2 sentences to prevent cognitive deviations. The AI anchor "Xiao C" of CCTV's international channel has adopted a similar cultural infiltration approach. When reporting on technological news, elements like paper-cutting and blue and white porcelain are ingeniously integrated into the background, allowing Chinese culture to naturally blend into the technological communication scenarios and reducing the sense of deliberate "cultural output".

5.3 Human-Machine Collaboration: Balancing Technological Efficiency and Human Warmth

5.3.1 Defining the Boundaries of Human-Machine Division of Labor

The integrated development of human and AI anchors requires a higher level of professionalism^[4]. In terms of core narrative, human anchors take the lead, focusing on the "emotional expression" aspect. For instance, when telling the stories of scientific researchers, human anchors use empathetic tones to convey "perseverance after failure" and "the warmth of teamwork," making the stories more touching. Meanwhile, AI takes on standardized basic tasks, such as

reporting data like "China's high-speed rail operation mileage exceeds 40,000 kilometers," completing multilingual conversions, and generating subtitles. By efficiently handling repetitive tasks, AI frees up human anchors' creative and emotional investment space, achieving a balance between technological efficiency and content warmth.

5.3.2 AI Assisted Detail Optimization

AI provides precise support based on the characteristics of overseas audiences. For example, it analyzes the auditory habits of audiences in different regions: Western audiences prefer fast-paced broadcasting, while East Asian audiences are more accustomed to a gentle tone. AI then recommends adjustments to the human anchor's speaking speed and pause duration accordingly. Additionally, AI can offer suggestions based on real-time interaction data. If a certain type of technology case receives a high number of comments and likes, it will recommend increasing the proportion of similar cases in subsequent broadcasts to further enhance the content's alignment with overseas audiences.

5.3.3 Early Avoidance of Ethical Risks

Establish a dedicated "AI Broadcasting Cultural Review Mechanism" and form a specialized review team composed of cross-cultural experts, broadcasters, and technical personnel. Before content is released, conduct a comprehensive pre-review of the AI-generated voice style, visual elements, and content expression to prevent cultural offense or information bias. At the same time, clearly define the boundaries of technology application: for core scenarios such as the release of major scientific and technological breakthroughs and in-depth interviews with scientific figures, human hosts must take the lead, and excessive AI substitution is prohibited, thereby ensuring the professionalism and humanistic bottom line of international communication.

6 Conclusion

AI technology provides efficient support for broadcasting and hosting to tell China's scientific and technological innovation stories in multiple languages and generate scenarios, enhancing the coverage and timeliness of international communication. Practices such as CGTN's multilingual broadcasts and the shortening of the communication cycle by the General Station's AI have confirmed the value of technology in optimizing communication efficiency. However, technology cannot replace human hosts in emotional expression and cultural context judgment. Over-reliance on AI may cause technological stories to lose their human warmth. Research has confirmed that only by building a three-dimensional system of "technology empowerment - cultural translation - human-machine collaboration", using AI to break through efficiency bottlenecks, using popularized expression and a global perspective to solve the problem of cultural discount, and balancing technology and humanity through human-machine division of labor, can we achieve the leap from "one-way communication of technology" to "connecting the world with technological stories", providing an effective path for China's scientific and technological innovation achievements to gain international recognition and acceptance.

References

- [1] Li Zhen, Li Huawei. Strategies for Cultivating Broadcasting and Hosting Talents for International Communication in the New Era [J]. *Media*, 2021(03): 86-88.
- [2] Zhou Lijuan, Zhang Yanlin. Towards the Future Together: AI Synthesized Anchors in the Smart Media Era [J]. *Audio-Visual World*, 2022(24): 32-34.
- [3] Li Zekai. Research on the Construction of Cross-cultural Discourse Power of Local Media Hosts Empowered by AI: Taking Short Video Communication as an Example [J]. *Journal of Journalism Research*, 2024, 15(24): 71-76.
- [4] Dong Yuhang. Strategies for Achieving "Human-Machine Coexistence" in Broadcasting and Hosting Based on Artificial Intelligence Technology [J]. *Television Technology*, 2024(05): 178-180.