

The Role of Intelligent Technologies in Enhancing the Precision and Efficiency of Translating Chinese Culture for Global Audiences

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ABSTRACT

In the context of globalisation, the translation and dissemination of traditional Chinese culture face practical challenges such as inefficient translation processes, distortion of cultural connotations, and mismatches between content and overseas audience preferences. These obstacles limit the effectiveness and influence of cultural outreach. This paper explores how intelligent technologies empower each stage of Chinese cultural translation. It systematically outlines specific pathways and practical safeguards for leveraging neural machine translation, natural language processing, intelligent recommendation algorithms, and big data analysis to optimize translation workflows, achieve precise audience targeting, and enable dynamic impact assessment. Findings demonstrate that intelligent technologies significantly enhance the efficiency of cultural translation output while effectively reducing cultural misunderstandings.

KEYWORDS

Intelligent technologies; Chinese cultural translation; Machine translation; Multidisciplinary talents

1 Introduction

China, an ancient civilization, possesses vast ancient philosophical thought and literary works, rich and profound folk traditions and artistic expressions. These constitute shared global cultural resources, yet conveying their unique value authentically to audiences worldwide remains challenging. Traditionally, professional human translators and conventional methods have been employed for promotion and introduction. However, these approaches are time-consuming and labour-intensive, and significant linguistic and cultural gaps often lead to misunderstandings or oversights of certain deep cultural connotations. Intelligent technologies—such as neural machine translation, natural language processing, and big data analytics—can significantly enhance the accuracy of cultural translation, reduce cultural misunderstandings, and deepen global understanding and friendship toward Chinese culture. This paper explores the role of intelligent technologies in cultural translation, aiming to reveal how technology empowers translators to narrate Chinese stories more accurately and vividly, thereby amplifying China's voice on the global stage.

2 Foundational conditions for intelligent technologies to empower accurate dissemination of chinese culture abroad

2.1 Core requirements for accurate dissemination of Chinese culture abroad

Idioms, classical allusions, traditional festival customs, and philosophical concepts within Chinese culture embody profound historical contexts and unique ethnic wisdom. Literal translations often confuse foreign readers. For instance, the idiom "taoguang yanghui" ("韬光养晦") directly translates as "conceal one's capabilities and avoid drawing attention," which, while conveying the basic meaning, loses the original text's nuanced, strategic cultural resonance. People from different countries and cultural backgrounds exhibit significant variations in linguistic expression, cognitive habits, and points of interest^[1]. Western readers are accustomed to direct, logically clear communication, whereas Eastern cultures often favour more subtle expressions, frequently employing imagery to convey emotions. Therefore, translation for international audiences must prioritize audience research—identifying who is reading, what they enjoy, and what forms of expression they can accept—to enhance content relevance and appeal. Moreover, in today's fast-paced information environment, audiences demand accuracy, timeliness, and relevance. Current cultural translation processes often suffer from inefficiency, with lengthy timelines from translation and proofreading to publication, causing content to become outdated.

2.2 Current integration of intelligent technologies in cultural translation and dissemination

Intelligent technologies are deeply integrating with China's cultural translation and dissemination efforts, yielding tangible results in two key areas: First, in the realm of online literature, Tencent News reported that by the end of 2024, Qidian International had catalogued approximately 6,800 translated Chinese online literature works, nurtured 460,000

overseas authors, and accumulated 300 million user visits. That same year, Qidian International added 3,200 AI-translated works (based on neural machine translation models), accounting for approximately 50% of all Chinese translations.^① These figures demonstrate how AI translation technology has significantly boosted the efficiency of web novel translation, amplifying the global influence of Chinese online literature. Second, intelligent technologies have accelerated the translation of film and television culture. Practical examples include China Media Group's 2024 production of China's first AI-animated series, "Ode to the Ages." Its first six episodes topped all satellite channel animations in viewership, accumulating 94.413 million total views and 13.182 million live streams on the CMG Video app.^② Leveraging CCTV's large-scale audio-visual media model and training on ancient paintings and poetry through natural language processing and computer vision technologies, the animation accurately interprets traditional cultural vocabulary to generate visually authentic Chinese-style imagery. This significantly enhances animation production efficiency and quality while advancing the international dissemination of Chinese culinary culture.

3 Key pathways for intelligent technologies to enhance the precision and efficiency of translating Chinese culture abroad

3.1 Optimizing translation workflows to improve cultural translation output efficiency

Historically, translations required extensive deliberation from initial drafts to final approval. Translating specialized texts rich in cultural depth—such as traditional Chinese medicine theories or Peking Opera terminology—often demanded expert involvement, resulting in time-consuming processes and low efficiency. Now, translators can leverage neural machine translation (NMT) technology to generate a foundational draft. Professional translators then refine cultural nuances and linguistic style tailored to the target audience, significantly reducing initial draft generation time. For instance, when translating a book introducing traditional Chinese festivals, machines can swiftly convert most descriptive content, while translators primarily annotate poetry, idioms, and cultural contexts—dramatically boosting overall efficiency^[2]. Chinese culture contains numerous unique concepts and terms—such as "solar terms," "Five Elements," and "Tang tri-color ware"—which often yield inconsistent translations across different translators, confusing readers. To address this, corpus-based terminology databases must be established to provide standardized translations. Among AI-assisted tools, grammar auto-checking tools—based on rules and statistical models—help translators quickly identify linguistic errors. At the same time, cultural annotation generators automatically add contextual explanations for specific concepts. When translating "端午节" (Duanwu Festival), the system not only provides "Dragon Boat Festival" as the translation but also automatically inserts a brief annotation explaining the origins of dragon boat racing and eating zongzi (rice dumplings), accompanied by relevant images and videos. This significantly boosts the efficiency of cultural translation production.

3.2 Precisely matching audience needs to enhance cultural translation adaptation efficiency

To ensure Chinese cultural content resonates with overseas audiences, analyzing user behaviour on behaviourmedia and video platforms is essential. This includes understanding their interests, cultural backgrounds, and linguistic habits to build multi-layered audience profiles. These profiles enable targeted cultural content promotion, increasing reach and engagement. Intelligent recommendation algorithms like collaborative filtering and content recommendation models can deliver the right content to the right people: If a user frequently watches food videos, the system will push multilingual shorts on Chinese cuisines—such as the preparation and cultural context of Sichuan or Cantonese dishes. For history enthusiasts, it will recommend illustrated content on topics like the Silk Road or Han Dynasty artefacts. The system can increase recommendations for similar material if users interact more with specific content. Beyond this, different audience groups also have distinct preferences in content formats—younger audiences favour short videos, while academic scholars tend to prefer documentaries^[3]. Therefore, planning multiple versions is advisable when producing cultural translation content. For instance, the same theme—"Chinese calligraphy"—could be developed into a 3-minute short video emphasizing visual presentation and experiential elements, while also produced as a concise, visually apparent documentary. This approach caters to diverse needs and enhances overall dissemination efficiency.

3.3 Dynamically monitor dissemination effects to improve cultural translation optimization efficiency

To better leverage intelligent technologies for translating Chinese culture and promote precise cultural dissemination,

① Data sources:<https://news.qq.com/rain/a/20241216A093YY00>

② Data sources:<https://news.cctv.com/2024/03/11/ARTIZ5ThLxQcngtA1UmPEWUS240311.shtml>

relevant personnel can utilise data visualisation analysis tools provided by dissemination platforms. These tools monitor metrics such as views, likes, shares, and comment content for each translated article or video. This helps gauge audience reception and track user interactions—identifying sections where users linger longer or links clicked more frequently—thereby uncovering content strengths and weaknesses. Communication effectiveness extends beyond click-through rates to encompass audience comprehension, emotional responses, and long-term impact. Communicators should also employ sampling surveys and online questionnaires to gather user feedback, inquiring whether content genuinely conveys cultural concepts and whether audiences express interest in further exploration. This identifies specific issues, enabling the avoidance of similar errors in subsequent creations or translations. Additionally, machine learning models can perform in-depth analysis of dissemination data, generating periodic effectiveness reports summarising which content types and expressions resonate most with audiences, while identifying terminology prone to misunderstanding. This feedback allows terminology databases to be refined and machine translation models optimized. This ensures translations increasingly meet audience needs precisely, ultimately enhancing long-term dissemination effectiveness.

4 Practical guarantees for enhancing the accuracy and efficiency of Chinese cultural translation through intelligent technologies

4.1 Improving the standardised system for intelligent cultural translation technologies

To ensure intelligent technologies effectively support the translation and dissemination of Chinese culture, a clear and actionable technical standards system must be established through collaborative development by cultural experts, linguists, and technical personnel. Specifically for machine translation, standards should provide concise explanations or cultural analogies for philosophical concepts like "benevolence" (仁) and "righteousness" (义) to aid reader comprehension. For intelligent recommendation algorithms, explicit requirements for fairness and transparency must be defined to prevent cultural content from being overlooked due to data bias ^[4]. Beyond establishing norms, selecting materials such as classical poetry, introductions to traditional customs, and excerpts from modern literary works is necessary. These should be processed using various machine translation tools, followed by expert teams' quality ratings of the translations. Additionally, user feedback analysis technology should be employed to gauge overseas audiences' translation accuracy and readability evaluations. This approach enables the timely identification of issues in technology application and facilitates targeted improvements. Given that culture evolves dynamically and technology undergoes rapid iteration, a standing committee should be established to periodically revise technical specifications, incorporating new cultural terminology and methodological approaches to ensure the precision of cultural dissemination.

4.2 Cultivating "technology + culture + foreign language" composite talent teams

While existing practitioners generally possess strong foreign language and cross-cultural competencies, they often lack an understanding of artificial intelligence concepts. This disconnect leads to a disconnect between technological implementation and practical work. To address this, curricula in translation, cultural studies, and foreign languages must incorporate AI-related concepts, natural language processing (NLP) methods, and data mining/analysis strategies. Translators should grasp machine translation principles, learn to apply corpus and lexicon technologies, and develop a scientific mindset through this process. Concurrently, cultural institutions and translation agencies should collaborate with technology firms to provide targeted technical training for translators, editors, and cultural project planners. Alternatively, engineers from translation software companies could be invited to demonstrate more efficient and intelligent tools like customizable terminology databases and Interactive Machine Translation (IMT). Such training would significantly enhance translators' accuracy and productivity.

4.3 Strengthening data security and copyright protection in cultural translation

Translating Chinese culture involves substantial data, including audience preference information, translation material repositories, and user interaction records. Any leakage could expose personal privacy and be misused, undermining the credibility of cultural dissemination. Therefore, all sensitive data must be encrypted during storage, with tiered access permissions established to ensure only authorized personnel can access critical data ^[5]. Regarding the copyright ownership of AI-assisted translations—whether it belongs to the tool developer, the translator, or the original cultural content creator—specific regulations can stipulate that the translator or their institution owns AI-assisted translations primarily produced by human translators. However, content generated entirely by AI must clearly indicate the technological source and adhere to open-source or licensing agreements. Furthermore, since cultural dissemination targets overseas audiences across multiple jurisdictions with varying data flow and copyright regulations, local measures

should be adjusted per internationally recognized data security standards. Collaboration with overseas platforms and institutions is essential to advance mutual recognition and protection mechanisms for copyright, ensuring Chinese cultural content receives due respect abroad.

5 Conclusion

In summary, intelligent technologies can optimize translation workflows, precisely match audience needs, and dynamically monitor dissemination outcomes, thereby significantly enhancing the accuracy and overall efficiency of translating Chinese culture abroad. This paper also proposes measures for technical standards, talent development, and data security safeguards to realize their full potential. As artificial intelligence technologies continue to evolve and deep learning capabilities strengthen, intelligent technologies will gain deeper insights into cultural contexts and convey cultural essence with greater nuance. Future research should prioritize exploring optimal human-machine collaboration models, promoting the deep integration of technological application and humanistic values, and ultimately establishing an efficient, inclusive international dissemination system for Chinese culture.

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