On the Underlying Logic of Translating Chinese Texts on Emergency Management into English in the AI Context

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Abstract: The advent of the artificial intelligence (AI) era has fundamentally transformed the production, translation, and dissemination of Chinese texts on emergency management, necessitating a comprehensive reevaluation of their characteristics, translation standards, and underlying logic. This paper systematically examines the key features of emergency management texts in the AI context, where traditional textual characteristics intersect with technological advancements to create new communicative paradigms. Through a multidisciplinary analysis drawing from translation studies, information science, and emergency management theory, we identify three core dimensions of contemporary emergency management texts: informational (characterized by real-time dynamism, uncertainty, and multi-modal data integration), functional (encompassing directive, informative, appellative, and coordinating functions), and linguistic (featuring specialized terminology, formulaic structures, and conciseness). Building upon these characteristics, we propose a tripartite set of translation standards prioritizing accuracy and consistency, clarity and operationalizability, and adaptability and human-AI collaboration. Furthermore, we delineate the underlying logic informing translation decisions through the integrated lenses of functionalist translation theory, information theory, and practice of emergency management. The paper argues that high-quality translation of emergency management texts in the AI era requires a sophisticated framework that leverages technological advancements while maintaining rigorous theoretical foundations, with particular emphasis on context-aware human expertise complementing AI capabilities. This comprehensive analysis contributes to the development of more effective, reliable, and theoretically informed practices in translating Chinese texts on emergency management, ultimately supporting enhanced cross-cultural communication during the whole cycle of emergency management.

Keywords: Chinese texts on emergency management; Translation in the AI context; Translation standards; Functionalist theory; Human-AI collaboration

1. Introduction

In an increasingly interconnected world facing complex natural and human-induced disasters, effective cross-

language communication before-during-and-after emergencies has become a critical component of global crisis response and routine emergency management. Emergency management texts—encompassing disaster alerts, contingency plans, situation reports, and public announcements—carry information that directly impacts response efficiency, international cooperation, and ultimately, human safety and security. And it is necessary to study translation from the perspective of text linguistics for the fact that "the texts are primary form of linguistic manifestations" and the basis for translation, and "translation, therefore, is a text-oriented event"[1] first and foremost. The translation of these texts, particularly between Chinese and English as global lingua francas, thus assumes unprecedented importance in facilitating timely and effective disaster management across linguistic and cultural boundaries.

Translation is definitely a dynamic activity and the product of translation is–if not dynamic in itself–then at least the outcome of a dynamic process [2].

The artificial intelligence era, characterized by rapid advancements in neural machine translation (NMT) and large language models (LLMs), has fundamentally disrupted traditional approaches to translating emergency management texts. Technologies such as China's "久安" (Jiu An) emergency management model exemplify this transformation, demonstrating AI's capacity to process emergency information with unprecedented speed and specialized knowledge[3]. While offering remarkable gains in processing efficiency and terminology consistency, this technological revolution also introduces new complexities that extend beyond conventional linguistic transfer. The central question has evolved from merely "How to translate accurately?" to "How to translate effectively for both automated systems and human decision-makers in high-stakes, time-sensitive environments?"

Despite growing recognition of its importance, the field of emergency management text translation in the AI context remains under-theorized, with practitioners often relying on ad hoc approaches rather than systematic frameworks. The development of standardized translation approaches is further complicated by the specialized nature of emergency management terminology, which requires consistency with established industry standards such as GA/T 1048.1-2013[4] for terminology translation. This paper addresses these gaps by proposing a comprehensive model that integrates textual characteristics, translation standards, and underlying theoretical logic specific to the AI era.

This paper proceeds with a multi-dimensional analysis of how AI technologies are reshaping emergency management texts' production, dissemination, and translation. By synthesizing insights from translation studies, information science, and emergency management practice, it aims to provide both theoretical grounding and practical guidance for professionals navigating this complex terrain. The structure proceeds as follows: Section 2 analyzes the key characteristics of emergency management texts across informational, functional, and linguistic dimensions; Section 3 establishes core standards for their English translation; Section 4 explores the underlying logic informing translation decisions through multiple theoretical lenses; and Section 5 presents conclusions and further research.

2. Key Characteristics of Texts on Emergency Management in the AI Era

Texts on emergency management constitute a specialized genre with distinct features that differentiate them from other text types. In the AI era, these characteristics have evolved to incorporate technological dimensions while retaining their core communicative purposes. This section analyzes these features across three interconnected dimensions: informational, functional, and linguistic.

2.1. Informational Characteristics

The information contained in emergency management texts exhibits several unique properties that directly impact translation approaches, particularly in AI-enabled environments:

Timeliness and Real-time Dynamism: Emergency situations are inherently dynamic, with information value rapidly depreciating over time. The speed of information delivery often determines the success of response operations. AI technologies have dramatically accelerated this aspect, with systems like the " 久安 " 大模型 (Jiu An large model) enabling " 秒级指挥 " (second-level command)[3]. Consequently, translations must be produced within compressed timeframes while maintaining quality, ensuring critical information reaches decision-makers and affected populations during optimal response windows. This temporal constraint often necessitates streamlined translation processes and specialized protocols that leverage machine translation with human oversight.

Uncertainty and Continuous Updating: Initial emergency information is frequently incomplete, contradictory, or speculative due to the chaotic nature of disasters. Texts often contain qualifiers such as "preliminary estimates" "unconfirmed reports," or "potential impact." Translators must preserve these shades of uncertainty accurately in the target language, avoiding premature clarification that might misrepresent the information›s reliability. As situations evolve, translations must accommodate updating information without creating confusion through inconsistent terminology, a challenge that AI systems can address through continuous learning and updating mechanisms.

Integration of Multi-modal Data: Contemporary emergency management increasingly relies on diverse data sources, including satellite imagery, sensor data, social media feeds, and field reports. The " 久 安 " model exemplifies this characteristic, utilizing AI to automatically scan videos for risks like " 人 员 集 聚 " (personnel gathering) or " 粉尘堆积 " (dust accumulation)[3]. Translations must account for these diverse data types, ensuring that textual representations of non-textual information remain accurate and meaningful across languages and cultures.

Practical Utility and Action-Orientation: Emergency management information derives its primary value from its ability to inform concrete actions. Translations must identify and prioritize information elements that directly support emergency operations, ensuring these are rendered with particular clarity in the target text. This often involves emphasizing actionable content over descriptive or explanatory passages, a task for which AI systems can be particularly effective when properly trained on emergency response corpora.

2.2. Functional Characteristics

From a functional perspective, emergency management texts serve diverse communicative purposes that dictate their structural and linguistic features, with AI technologies introducing new functional dimensions:

Being Directive: Operational plans, command instructions, and standard procedures are designed to guide and regulate emergency actions. These texts require translations that ensure unambiguous understanding of required actions, often employing imperative moods or mandatory language. The translator must preserve the authoritative tone while ensuring comprehensibility for the target audience. AI systems can enhance this function through consistent terminology application across documents and response phases.

Being Informative: Situation reports, damage assessments, and meteorological data primarily convey factual information. Translations must prioritize accuracy and completeness, avoiding distortions or omissions that might compromise situational awareness. Large language models contribute significantly to this function by processing " 海 量 知 识 " (massive knowledge) from " 文 献 、 法 规 、 案 例 " (literature, regulations, cases) to enhance

informational accuracy.

Being Appellative/Vocative: Public warnings, evacuation notices, and safety guidelines aim to persuade recipients to adopt specific protective behaviors. These texts require translations that balance accuracy with accessibility, using language readily understood by diverse populations. Cultural adaptation may be necessary to ensure the appellative function succeeds across cultural boundaries. AI technologies can support this function through sentiment analysis and culturally-aware language generation.

Being Coordinating: Inter-agency communications, meeting minutes, and resource deployment records facilitate collaboration among responding organizations. Translations must maintain terminological consistency to ensure shared understanding across different entities. The coordinating function often requires particular attention to institutional roles and responsibilities as represented in the text, a challenge that standardized terminology databases can help address.

2.3. Linguistic Characteristics

The language of emergency management texts exhibits distinctive features that translators must recognize and appropriately handle, with AI technologies introducing both challenges and solutions:

Specialized Terminology: The emergency management field contains numerous technical terms with precise meanings, such as "应急响应" (emergency response), "危险源" (hazard source), and "监测预警" (monitoring and early warning). According to public security industry standards GA/T 1048.1-2013[4], these terms require consistent, standardized translations to ensure professional accuracy. Translators must maintain discipline-specific terminology unless addressing general audiences, a practice that AI systems can reinforce through terminology management features.

Formulaic Expressions and Structural Consistency: Particularly in plans and procedures, emergency management texts often employ conventionalized language and fixed syntactic structures. Chinese emergency plans frequently utilize specific verb patterns and relational processes that may require transformation into more natural English equivalents. This might involve converting between active and passive voices or restructuring sentences for improved clarity in the target language. AI systems excel at recognizing and reproducing these formulaic patterns, ensuring consistency across documents.

Concise Expression: Field directives, operational guidelines, and public alerts prioritize linguistic economy. Translations should eliminate unnecessary verbiage while preserving essential meaning, using straightforward syntax and vocabulary. This conciseness supports rapid comprehension during time-sensitive operations, a quality that AI-enhanced translation tools can help achieve through automated simplification algorithms.

Human-AI Collaborative Dynamics: An emerging characteristic in the AI era is the collaborative nature of text production and translation, where "人工识别" (manual identification) interacts with AI capabilities. This collaboration manifests in translation workflows where AI handles initial drafting while human experts provide contextual refinement, particularly for culturally nuanced or high-stakes communications.

3. Standards for English Translation of Emergency Management Texts in the AI Era

According to Professor Liu Zhongde[5] (1998:14), "The so-called principles of translation and criteria of translation are actually the two sides of the same thing. The former lays emphasis on the translator, who should follow them while translating, whereas the latter on the reader or critic, who may use the criteria to evaluate a translation."

Here the terms "principle" and "criterion" will be used interchangeably. And the issue of translation criteria is considered as a fundamental one in translation practice, in teaching of translation and in translation criticism[6].

Based on the characteristic features analyzed above, we can derive core standards that should govern the English translation of emergency management texts, particularly in AI-enabled environments. These standards integrate general principles of professional translation with specific requirements of the emergency management domain and technological capabilities.

3.1. Accuracy and Consistency

Accuracy constitutes the foundational standard for emergency management translation, as even minor errors can produce serious operational consequences, while consistency ensures reliable communication across multiple channels and stakeholders:

Terminological Precision: Technical terms must reflect established equivalences according to industry standards and conventional usage. For instance, "应急指挥部" should be rendered as "emergency command center" rather than literal alternatives, while "危险源" translates precisely as "hazard source". Consistent terminology prevents misunderstanding in multi-agency responses, a requirement that AI systems can support through integrated terminology databases and translation memories.

Contextual Appropriateness: Word choices must consider the specific emergency context. For example, "救援" might translate differently depending on scenario—perhaps as "firefighting and rescue" in fire contexts versus "search and rescue" in earthquake responses. The translator must select equivalents that appropriately reflect the situational context, a nuanced task that currently requires human judgment despite advances in AI contextual understanding.

Information Fidelity: Translations must faithfully represent the original content without unauthorized addition, omission, or distortion. Critical details such as numerical values, temporal references, and geographical information require meticulous verification. The translator must distinguish between confirmed facts and unverified reports, preserving these distinctions in the target text. AI systems can enhance fidelity through automated consistency checks and fact verification against multiple sources.

3.2. Clarity and Operationalizability

Clarity ensures that the translated message is readily understood without ambiguity or confusion, while operationalizability focuses on the practical applicability of the information for emergency response:

Syntactic Clarity: English translations should avoid overly complex sentence structures that might impede rapid comprehension. Whereas Chinese frequently employs parataxis (connecting clauses without conjunctions), English often requires explicit logical connectors. Translators may need to restructure sentences to present information in logically accessible sequences, a process that AI systems can assist through syntactic analysis and restructuring algorithms.

Direct Expression: Operational directives and safety instructions benefit from straightforward formulation. According to principles of information theory, translation should minimize "noise" that interferes with message reception. For instance, "应做好疏散准备" might effectively translate as "Prepare to evacuate" rather than the more convoluted "Preparations should be made for possible evacuation," especially in urgent scenarios. AI systems can help identify and simplify overly complex expressions in translations.

Cultural and Operational Adaptation: Translations must consider the target audience›s cultural context

and practical circumstances. Chinese administrative divisions, institutional names, or specialized concepts may require explanation or adaptation for international understanding. The essence of China›s emergency management principle " 人民至上、生命至上 " might be rendered as "putting people and their lives above all else" to convey its significance to international audiences. This adaptation balance requires nuanced understanding that currently challenges AI systems.

3.3. Adaptability and Human-AI Collaboration

The AI era introduces new standards related to technological adaptation and the effective division of labor between human and artificial intelligence:

Human-AI Workflow Optimization: Translation processes should leverage the complementary strengths of human expertise and AI capabilities. As exemplified by the " 久 安 " model›s transformation of traditional workflows, AI can handle high-volume, time-sensitive initial translations while humans focus on quality assurance, cultural adaptation, and high-stakes communications. Effective workflows establish clear protocols for when and how human intervention occurs in the translation process.

Dynamic Updating and Consistency Maintenance: As emergency situations evolve and new information emerges, translations must be updated while maintaining consistency with previous communications. AI systems excel at tracking these changes and ensuring terminology remains consistent across updates, a capability particularly valuable in prolonged emergency operations with multiple information releases.

Format Preservation and Enhancement: Lists, tables, flowcharts, and other visual elements common in emergency management texts should be thoughtfully adapted in translation. Dense paragraphs might be converted into bulleted lists highlighting critical steps. AI capabilities can automatically identify and appropriately handle these non-textual elements, preserving their communicative function across languages.

Table 1. Translation Standards and AI Applications in Emergency Management Text Translation

Translation Standard	Traditional Application	AI-Enhanced Application
Accuracy and Consistency	Human consultation of specialized glossaries and style guides	Automated terminology consistency checks; translation memory systems
Clarity and Operationalizability	Manual simplification and restructuring of complex sentences	AI-powered syntactic simplification; readability optimization
Adaptability and Human-AI Collaboration	**Sequential translation and review processes**	**Integrated workflows with AI initial translation and human post-editing**

4. Underlying Logic of Translating Texts on Emergency Management in the AI Era

The translation of emergency management texts is not merely technical linguistic transfer but rests on multidimensional theoretical foundations that inform decision-making. Understanding this underlying logic enables translators to produce more effective, contextually appropriate translations, particularly when leveraging AI technologies.

4.1. Functionalist Translation Theory

Functionalist approaches to translation theory provide a fundamental framework for understanding emergency management text translation, with particular relevance in the AI context:

Skopos Theory and Purpose-Driven Translation: Hans Vermeer's skopos theory emphasizes that the translation purpose should determine translation methods and strategies. The "Skopos rule" is regarded as the top-ranking rule for any translation, meaning that a translational action is determined by its Skopos; that is, "the end justifies the means"[7] . The overarching skopos of emergency management translation is to support effective emergency response, which should guide all translational decisions. If source text rhetorical patterns would not achieve the intended effect in the target culture, the translator has license to adapt expressions to better fulfill the text's emergency purpose[7]. This principle remains essential in AI-enabled translation, where systems must be trained to recognize and prioritize the communicative purpose over literal accuracy when necessary.

Text Typology and Function Preservation: Generally, typology has been based on the functions of language. Several different functional divisions have been suggested: representative, expressive, cognitive. These are essentially the same as Reiss' informative, expressive and operative functions[8]. Werlich [9] suggests text type for a classification based on the function, rhetorical mode or aim of the text (description, narration, exposition, argumentation or instruction), and text form (variant) for a classification based on both formal and pragmatic criteria. Newmark[10] points out that "Few texts are purely expressive, informative or vocative: most include all three functions, with an emphasis on one of the three." And according to Katharina Reiss's text typology, emergency management texts predominantly represent both informative and operative text types. Their translation should prioritize achieving equivalent functionality in the target context. For directive texts, this means ensuring the translation elicits the intended operational response; for informative texts, it means guaranteeing accurate information transfer. AI systems can be trained to recognize text types and apply appropriate translation strategies accordingly.

Role Positioning in Human-AI Collaboration: Within the functionalist framework, both human translators and AI systems serve as cross-cultural emergency communication facilitators rather than merely linguistic mediators. The human translator must actively consider the usage scenario and recipient needs in the target context, adjusting strategies to ensure the text fulfills its protective function across cultural boundaries, while AI systems provide scalable capacity for high-volume translation tasks.

4.2. Information Theory and Communication Models

Information theory, particularly Claude Shannon's（an American mathematician, electrical engineer, and cryptologist, regarded as the founder of information theory）mathematical model of communication, offers valuable insights for emergency management translation in technologically-enhanced environments:

Information Encoding and Noise Reduction: The translation process resembles information encoding, where source language messages are converted into target language codes. According to Shannon›s definition of information as that which reduces uncertainty, the core task involves preserving and transmitting those message elements that eliminate critical uncertainties about the emergency situation—its nature, scope, severity, and appropriate responses. AI technologies can enhance this process through automated noise reduction, identifying and eliminating potential sources of miscommunication before translations are finalized.

Channel Capacity and Information Prioritization: Different recipient groups possess varying information processing capacities, or "channel capacity" in information theory terms. Professional emergency responders can process technical terminology, while general publics require simplified language. Translators must tailor information density and complexity to match target audience capacities, ensuring messages are neither overwhelming nor insufficiently detailed. AI systems can assist this process through audience analysis and

customized information presentation.

Feedback Loops and Quality Assurance: Effective communication requires feedback mechanisms to confirm message reception and understanding. In emergency management translation, this translates to robust quality assurance processes where translations are verified for accuracy and effectiveness. AI technologies enable new forms of feedback, including real-time readability analysis and comprehension testing, creating continuous improvement cycles for translation quality.

4.3. Logic of Emergency Management Practices

Perhaps most importantly, emergency management translation must align with the inherent logic of emergency management practices themselves, particularly as these practices evolve with technological integration:

Lifecycle Logic and Phase-Appropriate Translation: Emergency management comprises prevention, preparedness, response, and recovery phases, with texts exhibiting different characteristics in each stage. Prevention-phase documents emphasize risk analysis and require forward-looking translation approaches; response-phase communications focus on coordination and demand exceptional timeliness. Translators must recognize the operational phase and adjust their strategies accordingly, while AI systems can be programmed to automatically apply phase-appropriate translation protocols.

System Coordination and Terminological Harmonization: Emergency management constitutes a multi-agency collaborative endeavor where texts serve as coordination mechanisms. Translations must ensure terminology and expression consistency across documents and responding organizations to prevent coordination failures resulting from miscommunication. The development of standardized terminology databases, such as those referenced in GA/T 1048.1-2013[4], provides essential foundations for this harmonization, with AI systems enabling real-time consistency checks across multiple documents and agencies.

Institutional Logic and Conceptual Framing: Emergency management texts often reflect specific organizational structures and responsibility relationships. China's emergency management system features distinctive institutional arrangements such as " 应 急 办 " (emergency management office) with particular coordinative functions. When translating such content, practitioners must not only convey literal meaning but also consider how to represent the entity's position and function within China's emergency management framework, potentially using translation strategies like transliteration with explanation to minimize cross-cultural misunderstanding.And on certain occasions, it is quite necessary for a translator to resort to the use of explanation during the process of translation. For example, it is advisable for a translator to explain the meaning of the expressions" 四所一中心 "" 高低大化 "when translating the sentence like this: 发挥 " 四所一中心 " 科研优势，紧盯、储能电站、新能源汽车等灭火救援重大难点破题攻关 [11]。Actually, " 四所一中心 "refers to "Tianjin, Shanghai, Shenyang, and Sichuan Fire Research Institutes, and the National Fire Product Certification Center under the Ministry of Emergency Management. While" 高低大化 "refers to "High-rise buildings, Underground spaces, Large-scale Complex, Chemical plants". So the whole sentence can be rendered as this: We leveraged the research strengths of the "4+1 Consortium" (Tianjin, Shanghai, Shenyang, and Sichuan Fire Research Institutes, and the National Fire Product Certification Center under the Ministry of Emergency Management) to pioneer solutions for critical firefighting challenges in "HULC" complex scenarios (High-rise buildings, Underground spaces, Large-scale Complex, Chemical plants), energy storage facilities, and new energy vehicles through targeted technological breakthroughs[11].

This nuanced understanding requires cultural and institutional knowledge that remains challenging for AI

systems without human guidance.

5. Conclusion and Further Research

This paper has systematically examined the key characteristics, translation standards, and underlying logic of emergency management texts in the artificial intelligence era, presenting an integrated theoretical framework for their English translation. Our analysis demonstrates that emergency management texts constitute a highly functional, specialized, and time-sensitive genre whose translation must adhere to standards of accuracy, consistency, clarity, and operational applicability, guided by principles from functionalist translation theory, information theory, and emergency management practice.

In today's globalized environment characterized by increasing uncertainties and technological advancements, research on emergency management text translation carries significant theoretical and practical implications. The theoretical contribution lies in developing a multidimensional framework that connects linguistic analysis with emergency management practices and AI capabilities. Meanwhile, the practical value resides in providing structured guidance for translators, emergency managers, and policy-makers involved in cross-cultural disaster response, particularly as AI technologies become increasingly integrated into emergency operations.

Further research should explore several promising directions. First, enhancing AI capabilities through developing intelligent translation systems specifically trained on emergency management corpora to improve contextual understanding and decision-making in translations. Second, optimizing human-AI collaboration by establishing clearer protocols for the division of labor between human expertise and AI efficiency in various emergency scenarios. Third, addressing ethical dimensions including privacy concerns, algorithmic bias, and accountability frameworks for AI-assisted translations in high-stakes emergency environments. And fourth, expanding cross-cultural validation through empirical studies of how translated emergency messages are received and understood across different cultural contexts to validate and refine existing approaches.

Emergency management text translation, as an interdisciplinary research field, awaits further exploration by both scholars and practitioners. Only through deeply understanding the characteristics and underlying logic of these texts, while effectively leveraging emerging AI technologies, can translators produce high-quality target versions that effectively support international emergency cooperation. By advancing this specialized translation domain, we contribute to global efforts in saving lives and reducing disaster impacts across linguistic and cultural boundaries.

Disclosure statement

The author declares no conflict of interest.

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