

BREAKING LANGUAGE BARRIERS: HOW TRANSLATION DRIVES ARTIFICIAL INTELLIGENCE (AI) FORWARD

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Abstract

Translation in Artificial Intelligence (AI) is super crucial for breaking language barriers and making into accessible globally. However, language and cultural barriers pose significant challenges to effective communication and cooperation. The paper explores the critical role of translation in breaking language barriers with a view to driving Artificial Intelligence (AI) forward. We study the challenges and solutions to translation challenges in Artificial Intelligence (AI). Our analysis highlights the future trends in translating Artificial Intelligence (AI). We conclude that translation in Artificial Intelligence (AI) is a game-changer for global communication.

1.0 Introduction

Artificial Intelligence (AI) aims to integrate human to address complex challenges. Effective communication across languages and disciplines is crucial for the success of such roles. Translation plays a critical role in facilitating collaboration, knowledge sharing and implementation of AI initiatives. Translation is more than just a linguistic exercise, it is a bridge that connects cultures, facilitates dialogue, and promotes mutual understanding. According to the purview of some prominent scholars, translation can be described under five major areas as follows:

In the field of general linguistics, translation can be defined according to Catford (1965) as “the replacement of textual material in one language (SL) by equivalent textual material in another language (TL)”. While, according to the functionalist perspectives, Nord (2018) asserts that “translation is a purposeful activity carried out in a socio-cultural context”. Similarly, under cultural perspective, translation is considered as “not just a linguistic act but a cultural transfer that involves the translator’s interpretation and creativity”. (Bassnett, 2022).

In the modern theoretical view, Munday (2016) describe translation as “the process of producing a text, in a target setting and language, which is intended to convey the meaning of a source text in another language and culture”. Whereas, in the practical and professional angle, translation is seen as “a process that consists in reproducing in the receptor language the closest natural equivalent of the source-language message” Nida and Taber (1969). Going by the above definitions, translation can be identified as a very important tool which if properly used can accurately convey the nuance of language and culture, translation enables us to transcend linguistic and cultural barriers, paving the way for meaningful collaborations.

2.0 The Roles of Translation in Artificial Intelligence (AI)

Translation functions as a vital mechanism within cultural diplomacy. It enables the dissemination of literature, policy narratives, historical accounts, and local expressions, thereby opening up spaces for deeper intercultural engagement. Both high culture (such as classical literature and fine arts) and popular (such as media and everyday expressions) are made accessible to foreign audiences through effective translation strategies (Cull, 2008). In essence, translation plays a vital role in facilitating effective communication and cooperation. On the other hand, translation plays a critical role in Artificial Intelligence (AI) which aims to integrate human to address complex issues. Here are some key aspects of translation’s critical role in Artificial Intelligence (AI):

- (a) Global Reach: Artificial Intelligence (AI) systems can reach wider audiences across languages via translation, hence making services/products more inclusive. For instance, a Nigerian health AI platform uses translation to provide information on disease prevention in Hausa, Yoruba, Igbo, and English, reaching a broader audience. The impact here is that, more Nigerians access critical health information in their native languages, improving health outcomes.
- (b) Data Processing: Translation helps AI process and understand vast multilingual data, improving accuracy and insights. An example on global research, AI systems process multilingual research papers (English, French, Arabic) on tropical diseases prevalent in Nigeria, like malaria. Translation helps extract insights, improving local disease management. The benefit here is that researchers can analyze global data, enhancing Nigerian-focused solutions.

- (c) Communication: Enables humans to interact with AI systems in their native languages, hence enhancing user experience. In Nigerian situation for example, a Nigerian bank's AI chatbot uses translation to assist customers in Yoruba, Hausa, Igbo, and English, improving user experience. The impact here is that more customers can manage transactions comfortably in their preferred language.
- (d) Content Localization: AI-driven translation adapts content to fit cultural contexts, hence making it more relatable and effective. In Nigerian situation, an e-commerce adapts products descriptions and advertisements for Nigerian audiences in local languages (e.g. Hausa for Northern Nigeria), considering cultural nuances.. The benefit here is that higher engagement and sales as content feel more local and relatable.

3.0 Challenges and Solutions of Translation in Artificial Intelligence (AI)

Despite the growing importance of translation in AI, several challenges such as language barriers and cultural differences are identified to hinder effective communication in that regard. In other words, AI system which aims to integrate humans faces significant challenges. AI translation faces hurdles like:

- (a) Contextual accuracy: Idioms, sarcasm, and cultural nuances can get lost in translation. In this contextual challenge, translating Hausa idioms like “**kara a cikin tunani**” (add to thoughts = think deeply) requires cultural understanding. On the solution to contextual accuracy, context-aware models can be used (e.g. transformers with attention mechanisms) or train on domain-specific data (Nigerian legal or medical texts).
- (b) Low-resource languages: Limited data for languages like Nigerian Pidgin or minority languages makes AI translation less accurate. Nigerian languages like Efik or Ibibio might lack enough data for robust AI translation. On the low-resource languages, leverage transfer learning and multilingual models or collaborate with local linguists to create datasets for underrepresented languages.
- (c) Bias and cultural sensitivity: Translations might inherit biases from training data hence affecting appropriateness. Here, curate diverse, representative training data, and involve cultural experts in AI development and testing. On the other hand, there could be opportunities for Nigerians such as local language datasets, and

community involvement. In local language datasets, initiatives like **Masakhane** (for African languages) can boost Nigerian language translation. In the case of community involvement, partner with Nigerian linguists and tech communities to improve AI translation.

4.0 Best Practices for Translation Artificial Intelligence (AI)

Best practices for translation in Artificial Intelligence (AI) system are super practical and crucial for effective collaboration among human. Before dealing with the key aspects of best practices, let us glance at some strategies for effective translation. To maximize the benefits of translation, effective use of strategies is crucial for fostering meaningful understanding and mutual cooperation. This goes beyond lexical equivalence and accurate transfer, but also involves ideological, historical, and cultural meanings. The most important strategy here is dynamic equivalence, which highlights proper conveyance of intended meaning of a source text effectively, rather than following strictly to its lexical forms (Nida, 1964). This approach is highly effective in diplomatic, literary and intercultural communications, where emotional and contextual tones often outweigh literal accuracy.

Another important strategy is collaborative translation practices which involve linguists, subject matter experts, and native speakers to help ensure both linguistic precision and cultural relevance. The integration of computer-assisted translation (CAT) tools, while valuable for improving productivity and consistency, must be complemented by human interpretation to maintain nuance and contextual depth (Bowker & Fisher, 2010).

In sum, effective translation in international cooperation hinges on a strategic blend of linguistic expertise, cultural intelligence, and technological support, all of which are vital for building sustainable and respectful intercultural relationships. Furthermore, cultural adaptation, where translators are allowed to localize content in a source language to suit the socio-cultural context of the target audience, is yet another strategy for effective translation. However, this process requires substituting culturally specific and linguistic figures (idioms or metaphors) with equivalent expressions that are comprehensible and appropriate within the target culture (Newmark, 1988).

High quality translation requires more than linguistic fluency, it necessitates adherence to established best practices that ensure accuracy, consistency, and cultural appropriateness (Yakasai, 2019a). One foundational best practice is pre-translation preparation, which involves understanding the source materials purpose, audience, and context. This allows the translator to make informed

decisions on tone, register, and terminology (Munday, 2016). Clarity about the target audience, whether governmental, academic, or the public, it guides the translator in maintaining the communicative intent of the original text.

Contextual and cultural sensitivity is another best practice critical to intercultural translation. This includes recognizing and appropriately rendering idiomatic expressions, metaphors, and culturally loaded terms that may not have direct equivalents in the target language (House, 2015). Translators working in Artificial Intelligence (AI) system must therefore cultivate bicultural literacy and consult cultural mediators or advisors when needed. Equally important is the use of quality control mechanisms such as peer reviews, back translation, and proofreading.

These measures help ensure fidelity and clarity, especially in official or technical documents. Adopting terminology management systems, maintain style guides, and using translation memory tools can also enhance consistency across multiple translations (Gouadec, 2007). Ultimately, there should be ethical considerations (including fidelity to the source text and transparency in adaptation), which must underpin all practices. By adhering to these principles, translation becomes a bridge that not only conveys information, but also respects and preserves cultural identities

On the other hand, the key aspects of the best practices include the following:

- (a) Clear communication: Using plain and lucid language helps avoid misunderstandings across disciplines.
- (b) Cultural sensitivity: Considering local contexts and nuances enhances translation relevance and effectiveness
- (c) Standardized terminology: Establishing common vocabulary ensures consistency and accuracy in translation.
- (d) Collaboration: Working with experts from various fields ensures translation meet diverse needs.
- (e) Adaptability: Translations should be flexible to accommodate different formats, like technical reports or community outreach materials..

5.0 Future Trends in Translation of Artificial Intelligence (AI) System

The future of translation in Artificial Intelligence (AI) is looking bright. We are seeing some major advancement in 2025, with AI-driven real-time speech-to-speech translation and voice synthesis becoming more seamless. Imagine attending a global conference and understanding every speaker in your native language – that is the future we are heading towards. For instance, there are future trends such as multimodal translation, where AI translating text, voice, and visuals (e.g., images, videos) in real-time. Personalized translation is also possible. This is a situation where AI adopting translation based on user preferences, context, and culture. Ethical AI translation on the other hand, is where the focus is on bias mitigation, privacy, and transparency manifest in translation processes. Other key trends shaping the industry include:

- (a) Adaptive Artificial Intelligence (AI): AI is becoming a true collaborator, handling repetitive tasks and freeing up human translators to focus on creativity and complex problem solving.
- (b) Hyper-localization: AI tools are analyzing regional cultural nuances, slang, and societal trends to craft translations that truly resonate with local audiences.
- (c) Specialized Artificial Intelligence: AI is being tailored to niche industries like legal, medical, and technical fields, ensuring higher accuracy and relevance.
- (d) Ethical Artificial Intelligence (AI): In this kind of AI, data privacy and security are becoming top priorities, with translation providers prioritizing end-to-end encryption and user control.
- (e) Multimodal translation: Artificial Intelligence (AI) is expanding beyond text to include audio, video, and visual elements, hence revolutionizing content creation.

6.0 Conclusion

Translation in Artificial Intelligence (AI) is a game-changer for global communication, data processing, and accessibility. Addressing challenges like contextual accuracy, low-resource languages, and bias will shape the future of Artificial Intelligence (AI) translation. On the other hand, collaboration between tech innovators, linguists and cultural experts is crucial for effective, inclusive Artificial Intelligence (AI) translation solutions. There is no doubt that translation is the most powerful tool for improving Artificial Intelligence

(AI) systems. By bridging cultural and linguistic divides, we can foster greater understanding, cooperation and cultural benefits. Therefore, translation here serves as a critical component of Artificial Intelligence (AI), because it enables effective communication, build trust, and foster cooperation. By addressing the challenges and leveraging the opportunities, translation can play a vital role in advancing the goals of Artificial Intelligence (AI) system. In short, effective translation is pivotal in Artificial Intelligence (AI) system, hence breaking language barriers and driving Artificial Intelligence (AI) forward.

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