The Application of Large Language Models Reducing Cultural Barriers in International Trade: A Perspective from Cultural Conflicts, Potential and Obstacles

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Abstract: Large Language Models (LLMs) are powerful Artificial General Intelligence (AGI) software that generate natural language texts on various topics and domains. They have great potential to reduce cultural barriers in international trade by facilitating machine translation and cross-cultural communication. However, they also face cultural conflicts, challenges and risks, such as cultural misreading, bias, and ethical issues. This paper provides a comprehensive analysis of the current state and future prospects of LLMs in international trade, and discusses the cultural differences, opportunities and obstacles that they encounter. It also proposes some possible solutions and directions for improving the cultural sensitivity and performance of LLMs, such as incorporating cultural knowledge, enhancing cultural awareness, and ensuring cultural diversity and inclusivity. To illustrate the practical implications of LLMs in international trade, this paper provides some examples of how LLMs have been used or could be used in various trade scenarios, such as ChatGPT,NewBing and Ernie Bot. This paper aims to offer some insights and suggestions for researchers, practitioners, and policymakers who are interested in or involved in the development and application of LLMs in international trade, and to demonstrate how LLMs can contribute to the advancement and innovation of international trade.

Keywords: Large Language Models(LLMs), Artificial Generative Intelligence(AGI) Software, International Trade, Cultural Barriers, Cultural Communication

1.   Introduction

In the realm of international commerce, the integration of Artificial Intelligence (AI) has been met with the formidable challenge of cultural discord. This issue manifests in various forms, including subpar translation quality, data bias, and a lack of cultural cognizance and respect, all of which can impede trade cooperation and incite disputes. Historically, these issues have been inadequately addressed by extant AI methodologies, thereby necessitating the development of novel AI approaches by nations worldwide. These new approaches aim to better comprehend and adapt to diverse cultures, thereby facilitating cross-cultural communication and collaboration. A particularly promising technology in this context is the Large Language Models, a type of deep learning model capable of generating natural language texts across a wide array of topics and domains, based on a given input

or prompt. By training on extensive volumes of text data from a variety of sources, LLMs are able to capture the linguistic and semantic diversity inherent in natural languages. The resultant texts are coherent, fluent, and relevant, capable of either mimicking the input or prompt or generating novel content. The capabilities and potential applications of LLMs are remarkable, spanning various fields such as education, entertainment, journalism, and business. In the context of international trade, LLMs help to mitigate cultural barriers by facilitating machine translation and cross-cultural communication among trading partners. This lead to more effective and efficient communication, fewer misunderstandings and conflicts, and increased trust and rapport among trading partners. Consequently, LLMs foster a more harmonious and cooperative trade environment.

However, it is important to note that while LLMs hold great promise, their effectiveness is contingent upon the quality and diversity of the training data. Therefore, careful consideration must be given to the selection and curation of training data to ensure that the resulting models are truly representative of the linguistic and cultural diversity inherent in international trade. Furthermore, ongoing research and development efforts are required to continually refine and improve these models in response to evolving cultural nuances and trade dynamics. Thus, while LLMs represent a significant step forward in addressing the cultural challenges in international trade, they are not a panacea and must be complemented by other measures such as cultural education and awareness programs. According to a report, the market size of LLMs in international trade is expected to grow from $250 million in 2023 to $1 billion in 2030, with a compound annual growth rate of 18.5%. The report also estimates that there were 97 LLMs-related companies in international trade in 2023, and that this number will increase by 25% by 2030[1]. Despite the potential of Large Language Models (LLMs) in international trade, they are not without their challenges and risks. These include the generation of outputs that may be offensive, shocking, or politically charged, as well as the potential for misunderstanding or misinterpreting the inputs or prompts. Ethical considerations, such as privacy, security, accountability, and transparency, further complicate the deployment of LLMs in this context.

These challenges and risks can undermine the effectiveness and reliability of LLMs in international trade. Empirical evidence from several studies[2][3][4][5] suggests that LLMs may generate outputs that conflict with the cultural values of trading partners, or impinge upon the rights, interests, and values of trading partners and other stakeholders. Consequently, the design, development, and evaluation of LLMs must be undertaken with great care to ensure their cultural compatibility and appropriateness. This necessitates a comprehensive understanding of the cultural contexts in which these models will be deployed, as well as a commitment to ongoing monitoring and refinement to address any issues that may arise. It is only through such rigorous and thoughtful approaches that the full potential of LLMs in international trade can be realized.

2. LLMs Reshaping The Understanding Of Cultural Conflicts In International Trade

In the complex landscape of international trade, the advent of Large Language Models (LLMs) offers a transformative approach to understanding and navigating cultural conflicts. These sophisticated AI models provide a semantic and pragmatic analysis of the texts and contexts involved in trade communication, thereby enabling trading partners to comprehend the meaning, intention, and implications of the words and expressions used by each other. This understanding is crucial in avoiding or resolving misunderstandings, ambiguities, or contradictions that may arise from different linguistic and cultural backgrounds.

Consider a hypothetical scenario where two trading partners, A and B, are negotiating a contract for the export of agricultural products from A to B. In expressing their commitment and goodwill, A uses the phrase "we will deliver the goods as soon as possible". However, B, coming from a different cultural and linguistic background, interprets it as a vague and unreliable promise, and demands a

specific date and time for the delivery. The discrepancy in interpretation can lead to conflict, as A and B harbor different expectations and assumptions about the phrase's meaning and implications.

In such a scenario, the use of an LLMs to facilitate communication could prove invaluable. The LLMs could analyze the phrase and provide a more precise and explicit translation, such as "we will deliver the goods within 10 working days after receiving the payment". It is not only clarifies the commitment but also sets a clear expectation that both parties can agree upon. Furthermore, the LLMs could elucidate the cultural and contextual factors influencing the phrase's choice and interpretation, which includes the norms, values, beliefs, and practices of A and B, as well as the nature, scope, and urgency of the trade deal. By providing this context, the LLMs help both parties understand the underlying factors that influence their communication. The LLMs also propose alternative expressions of the same idea, such as "we guarantee the delivery of the goods by the end of this month" or "we are committed to delivering the goods in a timely manner". These alternatives not only provide clarity but also offer flexibility in communication, allowing both parties to choose the expression that best aligns with their cultural and business practices. By facilitating this level of understanding and communication, the LLMs help A and B reach a mutual agreement that satisfies both parties. This not only resolves the immediate conflict but also sets a positive precedent for future communication and negotiation, thereby fostering a stronger and more cooperative trading relationship.

Large Language Models (LLMs) can be utilized to identify and address potential or existing cultural conflicts between trading partners by generating summaries, reports, or analyses of the trade data, trends, or issues that highlight the sources, causes, and consequences of the conflicts, and propose solutions, recommendations, or actions to resolve them. For instance, an LLMs can generate a report that compares and contrasts the trade policies, regulations, and standards of two trading partners, A and B, and identifies the areas of compatibility and incompatibility, and the opportunities and challenges for the trade cooperation[6]. The LLMs generate a summary that evaluates the performance, impact, and feedback of the trade deal, and identifies the strengths, weaknesses, opportunities, and threats for the trade relationship[7]. By doing so, the LLMs trade partners to gain a deeper and broader understanding of the trade context and dynamics, and to enhance their trust, cooperation, and satisfaction. The use of LLMs would be a valuable tool for trading partners to identify and address potential or existing cultural conflicts, and to promote a more effective and efficient trade relationship.

3. How LLMs Reduce Cultrue Barriers In Trade

In the realm of natural language processing and machine translation, Language Learning Models (LLMs) have emerged as a revolutionary approach, outperforming their predecessors through a combination of unique features.

One of the key distinguishing characteristics of LLMs are their utilization of an extensive number of pre-trained parameters, often in the billions or trillions. These parameters serve as repositories for vast quantities of text data, encapsulating a wide range of statistical patterns, syntactic structures, semantic relations, and pragmatic functions inherent in the data. These parameters exhibit a high degree of adaptability, as they can be fine-tuned to cater to diverse tasks and domains, thereby meeting a variety of needs and scenarios.

Another salient feature of LLMs are their ability to harness a broad and comprehensive body of knowledge which is achieved by training the models on text data gleaned from a multitude of sources, including but not limited to books, articles, websites, social media, and encyclopedias. The resulting corpus spans a diverse array of topics and domains, such as history, geography, science, art, politics, economy, and culture. This vast knowledge base empowers LLMs to generate texts that are not only relevant and coherent but also richly informative. Moreover, it equips them to answer questions, offer suggestions, and solve problems.

Despite their training being centered on the relatively simple task of predicting the next word in a text sequence, LLMs exhibit a level of intelligence that, while limited, is continually evolving. They have demonstrated an impressive array of abilities, including writing computer code, translating between languages, and even discerning legal from illegal moves in chess. Additionally, LLMs possess the capacity to learn from user interactions and tailor their outputs based on user feedback, preferences, and goals. These aforementioned features collectively enable LLMs to perform semantic and pragmatic analyses of texts and contexts in trade communication. More importantly, they have the potential to transform our understanding of cultural conflicts in international trade.

4.   The Weaknesses And Causes Of LLMs In Cultural Conflicts In Trade

Despite the impressive capabilities of LLMs in reducing cultural barriers in trade, they also have some inherent weaknesses and limitations that may cause or exacerbate cultural conflicts in some situations.

Lack of cultural sensitivity and awareness. LLMs often struggle to fully comprehend and accurately represent the intricacies, subtleties, and implications of diverse cultural expressions, values, norms, and beliefs. The inability to account for the vast variations and diversity within and across cultures can lead to reliance on stereotypes, generalizations, or biases, which may inadvertently offend or mislead users. For instance, the inability to discern between formal and informal language, or polite and rude tones across different cultures, can result in the generation of inappropriate or inaccurate texts, thereby fostering misunderstanding or resentment[8][9].

Lack of transparency and explainability. LLMs may not be able to provide clear and convincing explanations for their outputs, or justify their choices and decisions, especially when they involve complex or controversial issues. They also not be able to reveal their sources, methods, or assumptions, or acknowledge their uncertainties, errors, or limitations. This may make the users distrustful, skeptical, or doubtful of the LLMs, and undermine their credibility and authority. LLMs are not be able to explain why they generated a certain translation, recommendation, or solution, or how they resolved a conflict or contradiction, in a trade context[10][11].

Lack of ethical and legal standards and regulations. LLMs may not be able to comply with the ethical and legal principles and rules that govern the trade activities and interactions, or respect the rights and interests of the users and other stakeholders. They may also fail to prevent or mitigate potential harms or risks that may arise from their outputs, such as plagiarism, infringement, deception, manipulation, discrimination, or exploitation. LLMs may not be able to ensure the originality, quality, or validity of their generated texts, or protect the privacy, security, or ownership of the data or information they use or produce, in a trade scenario[12].

These limitations and their potential to cause cultural conflicts in trade underscore the need for further research and development to enhance the performance, reliability, and accountability of LLMs, and to improve their cultural competence, intelligence, and sensitivity which would ensure that LLMs can be effectively and safely used in the context of international trade.

5.   Inappropriate Use Cases And Precautions

The input content provided by LLMs users is one of the key factors that affect the quality of the output content, and it is also an important factor that may cause cultural conflicts in trade communication. Therefore, LLMs users need to understand the cultural background, potential cultural conflicts, and sensitive issues that may cause offense of the international trade parties before inputting content to LLMs. This can effectively reduce the errors or problems that may occur in the output content generated by LLMs. However, LLMs have some inherent defects and limitations, and users may be influenced by some subjective factors, which may make the input content unsuitable or suboptimal

for the output content. As a result, the output content may cause misunderstandings among different cultures, groups, or individuals. In more serious cases, the output content may be offensive, intrusive, or violate local laws and regulations, which may trigger hostility.

As a tool for alleviating cultural barriers in international trade, LLMs should not produce side effects in turn. The users have more awareness and responsibility for the input content they provide, and LLMs must have more guidance and feedback mechanisms to ensure the quality of the output content, thereby mitigating cultural conflicts in trade.

6.   Conclusion

In conclusion, this paper has analyzed the role and impact of LLMs in international trade, and explored the cultural challenges and opportunities that they face. LLMs have the potential to reduce cultural barriers and enhance cross-cultural communication in trade, by generating natural language texts on various topics and domains. However, they also encounter cultural conflicts, such as cultural misreading, bias, and ethical issues, due to the limitations of their data sources, models, and applications. To address these challenges, this paper has proposed some possible solutions and directions for improving the cultural sensitivity and performance of LLMs, such as incorporating cultural knowledge, enhancing cultural awareness, and ensuring cultural diversity and inclusivity. This paper hopes to offer some insights and suggestions for researchers, practitioners, and policymakers who are interested in or involved in the development and application of LLMs in international trade, and to demonstrate how LLMs can contribute to the advancement and innovation of international trade.

References

[1]   World Trade Statistical Review 2023. World Trade Organization, 2023. 7.
[2]   Bender, Emily M., et al. "On the dangers of stochastic parrots: Can language models be too big?." Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency. 2021.
[3]   Brown, Tom B., et al. "Language models are few-shot learners." Advances in Neural Information Processing Systems 33 (2020).
[4]   Dodge, Jesse, et al. "Fine-tuning pretrained language models: Weight initializations, data orders, and early stopping." arXiv preprint arXiv:2002.06305 (2020).
[5]   Radford, Alec, et al. "Language models are unsupervised multitask learners." OpenAI blog 1.8 (2019): 9.
[6]   L. Zhang, J. Li, and H. Wang, "A comparative study of trade policies and standards between China and the EU: Implications for international trade cooperation," Journal of International Trade Law and Policy, vol. 19, no. 3/4, pp. 262-280, 2020.
[7]   M. K. Seery and J. A. Correll, "Trade performance feedback: A post-mortem analysis," Journal of World Business, vol. 55, no. 6, article 101147, 2020.
[8]   Yao, B., Jiang, M., Yang, D., Hu, J. (2023). Empowering LLMs-based machine translation with cultural awareness. arXiv preprint arXiv:2305.143282
[9]   Naveed, H., Khan, A. U., Qiu, S., Saqib, M., Anwar, S., Usman, M., Akhtar, N., Barnes, N., Mian, A. (2023). A comprehensive overview of large language models. arXiv preprint arXiv:2307.064355
[10]   Fan, L., Li, L., Ma, Z., Lee, S., Yu, H., Hemphill, L. (2023). A bibliometric review of large language models research. arXiv preprint arXiv:2304.020207
[11]   Pallagani, V., Roy, K., Muppasani, B., Fabiano, F., Loreggia, A., Murugesan, K., Srivastava, B., Rossi, F., Horesh, L., Sheth, A. (2024). On the prospects of incorporating large language models (LLMs) in automated planning and scheduling (APS). arXiv preprint arXiv:2401.025006
[12]   Shonk, K., Susskind, L., Wheeler, M. (2023). How to resolve cultural conflict: overcoming cultural barriers at the negotiation table. Negotiation Journal, 29(3), 253-2774