

Exploring the Advantages and Limitations of Machine Translation in the Performance of Construction Industry

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Abstract

In building, MT has perks and cons. The globalized building is more dependent on MT. It handles project communication despite language barriers. This study will assess industrial MT's pros and cons. Detailed literature reviews, case studies, and industry reports were used. Machine translation may boost efficiency, productivity, and multilingual teamwork in construction. Translating technical information, requirements, and drawings quickly aids project execution. According to studies, building machine translation has downsides. Translating technical and sophisticated architectural jargon requires accuracy and context. Cultural and language barriers can sometimes make translation difficult. Recommendations followed. Construction companies use a mixed machine-human translation method to ensure quality and accuracy. Construction glossaries and dictionaries help with translation. MT can also increase its performance in building projects by training project teams and translators. In conclusion, machine translation eliminates language barriers in construction. To reduce concerns, its limitations must be identified, and suitable remedies adopted. Research should adjust machine translation algorithms for construction terminology and context. Studies should use AI and NLP to improve translation accuracy and efficiency.

Keywords: Machine Translation, Construction Industry, Firm performance

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I. Introduction

Given the breadth and complexity of the construction industry on a global scale, effective communication channels and collaborative efforts among a broad collection of actors, many of whom may speak more than one language, are absolutely necessary (Metcalf-Hough, 2022). Language barriers make it more difficult for people to understand one another, which can lead to misunderstandings, mistakes, and delays throughout the course of the construction process (Subramaniam et al., 2022). In recent years, machine translation (MT) has emerged as a viable option that has emerged as a potential way of supporting people in communicating more effectively across linguistic barriers (Mehandru et al., 2022). This has taken place in response to the growing demand for such a service. In this section, the goals and objectives of the study are outlined, the subject matter that is the focus of the investigation is presented, a summary of relevant prior research is provided, potential avenues for further investigation are suggested, and an overall overview of relevant prior research is presented (Royer et al., 2022). While machine translation can be a valuable resource for gaining a preliminary understanding or for non-critical communication, it is important to recognize its limitations in the realm of corporate governance and performance in the construction industry (Alabdullah et al., 2014; 2015; 2018; 2014; 2016;2019; 2014; 2015; 2018; 2014; 2016;2020; 2014; 2017; 2018; 2013; 2016;2023; 2014; 2015; 2018; 2014; 2019;2013; Alabdullah et al., 2014; 2016; Ahmed et al., 2015; 2016; 207;2019;2023;2022; 2013; 2016;2023; 2014; 2015, Kanaan et al., 2018; 2019;2023).

Research done in the past has investigated a wide variety of alternative strategies for overcoming language barriers because it is widely acknowledged that this subject is extremely important in the building and construction industry (Al-Hashimy, 2022d; Al-Hashimy, Alabdullah, et al., 2022; Al-Hashimy, Said, et al., 2022; Al-HASHIMY & Al-hashimy, 2019). The results of these studies shed light on how important it is to have access to a translation service of a high quality for all of one's technical communications, documents, and specifications. This is made clear by the fact that the conclusions of these analyses were similar. In spite of the fact that a number of studies have been carried out to study the potential benefits of MT in the building industry, there is still room for development in our understanding of the industry's drawbacks. In addition to this, there is a demand for real-world proof to back up the implementation of MT in the construction industry (AL-HASHIMY, 2017; Almashhadani, 2022; Alabdullah et al., 2019; AL-HASHIMY, 2018, 2019, 2022a, 2022b, 2022c). Because most of the prior research has concentrated on the theoretical aspects of implementation, there is currently a vacuum in our understanding that has to be filled.

Because of this knowledge gap, the purpose of this study is to address it by carrying out an empirical analysis of the advantages and disadvantages of employing the use of machine translation in the construction business. Specifically, the research will look at the advantages and disadvantages of using machine translation in the construction industry. This project has as its goal the identification of theoretical, methodological, conceptual, and empirical inadequacies in MT as well as the development of remedies to solve these shortcomings. This research aims to fill in these gaps and provide insight into the usefulness and potential of MT in simplifying communication during construction projects. The purpose of this research is to fill in these gaps and provide insight. Concerning the Investigation, Questions For individuals working in the construction business, the use of machine translation presents a number of benefits as well as obstacles. How can we enhance the application of machine translation in the construction industry from an empirical, methodological, theoretical, and philosophical standpoint? What are some methods that we could improve the application of machine translation?

II. Objectives

The primary purpose of this study is to explore the benefits and drawbacks associated with making use of machine translation in the construction business. In particular, it anticipates being able to carry out the following:

Learn both the benefits and the drawbacks of using machine translation to improve communication on construction sites by reading the following sentence. Investigate the possibilities for advancement in machine translation from a number of different points of view, such as empirical, methodological, theoretical, and conceptual study. It would be helpful if you could make some concrete comments regarding the ways in which the use of machine translation might aid construction projects.

In the event that these goals are accomplished, this research will make a significant contribution to the body of previous work that has been done on the use of machine translation in the building and construction sector. In addition to this, it will provide professionals, academics, and anyone else interested in multilingual building projects with information that will be of great use to them.

III. Literature Review

In this review of the pertinent literature, we investigate the historical applications of MT in the construction industry and how it has been utilized. It provides a concise summary of the most significant findings and inferences made from these studies, highlighting the benefits, shortcomings, and opportunities for further development of the application of MT in construction projects. Several studies have identified difficulties with language as a key barrier to effective communication in the construction industry (Memarian et al., 2022). This barrier has been recognized as a significant obstacle. It has been determined that MT is a technique that has the potential to be effective in enhancing communication within multiethnic communities (Yoon & Pishdad-Bozorgi, 2022). It has been demonstrated that MT has benefits, such as improved prospects for cooperation, a shorter turnaround time, and enhanced accuracy in translating technical documents and specifications (Qin et al., 2023). very good and strong sensitive translations makes companies to convey their brand message effectively, ensuring a positive image and customer satisfaction. Moreover, translation teaching enhances efficient cross-cultural collaboration within multinational teams, fostering synergy and innovation. Via investing in translation education, firms can gain a competitive edge by seamlessly navigating linguistic complexities, minimizing misinterpretations, and maximizing business opportunities in the global arena. The relationship between translation teaching and firm performance is thus one of strategic importance, enabling organizations to thrive in an increasingly interconnected world.

MT has been proven to suffer with accuracy and context preservation in two areas: specialized construction language and complex jargon (AL-Hashmy et al., 2022; Arumugam et al., 2015; Hasan et al., 2015; HUSSAIN, 2017; Hussain, Alabdullah, Ahmed, et al., 2023; Hussain, Alabdullah, & Kanaan Abdulkarim, 2023; Hussein et al., 2015; Hussein et al., 2023). Both of these domains involve construction terminology. To improve the quality of translation and meet the demands of the construction industry, dictionaries and glossaries that are specifically designed for that sector are required, according to research (Bayekeyeva et al., 2022). The accurate translation of the text that is relevant to the building is made much more difficult by the intricacy of different cultures and the regional differences in how language is used. In order to circumvent these limitations, researchers have devised a hybrid technique that combines machine learning with human expertise. This approach makes use of the speed and efficiency offered by MT, but it continues to rely on human translators for matters pertaining to correctness and context (Liu, 2022). Studies have shown that continual training and upskilling of project teams and translators is essential to overcoming the limitations of MT and increasing its usefulness in the construction industry. This can be accomplished by overcoming the constraints of MT. Although there has been a significant amount of research conducted on MT in the construction sector, there is a dearth of concrete evidence to support the claims made for its application in real-world projects or to evaluate

the impact it has on the outcomes of such projects. According to the findings of the research, additional empirical investigations are required to investigate the potential benefits and limitations of MT when applied to real-world construction projects. This kind of research has the potential to shed light on the benefits and drawbacks of MT as well as the various ways in which it could be enhanced.

IV. Conclusion

Finally, the use of machine translation has the potential to reduce the impact of linguistic barriers on collaboration within the construction industry. According to the aforementioned literature, the benefits of MT are numerous and have been widely studied. These benefits have been extensively covered. Nevertheless, there are limitations in terms of precision, context preservation, and cultural nuance that have been noted. It is recommended that human experience be combined with machine translation in order to maximize the effectiveness of machine translation in construction projects. This approach can guarantee a higher level of translation quality while also overcoming the inherent limitations of MT. To achieve an increase in the accuracy and readability of translated materials, it is necessary to compile specialised construction dictionaries in addition to providing ongoing training for translators and project teams. It is necessary to do additional field research in order to evaluate the efficacy and use of MT in actual building projects. This kind of research has the potential to offer insight into the benefits, drawbacks, and opportunities for improvement related to the usage of MT in the corporate realm. When these knowledge gaps are filled in and the appropriate strategies are implemented, the construction industry may be able to make better use of machine translation to overcome language barriers in communication and collaboration, which will eventually lead to better results being produced.

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