The Impact of Machine Translation of the Noble Qur’an on the Semantic Value of the Produced Text: An Analytical Evaluative Study of English-language Translations and their Fidelity to the Qur’anic Scripture

Impact de la Traduction Automatique du Noble Coran sur la Valeur Sémantique du Texte Produit : Etude Analytique et Evaluative des Traductions en Langue Anglaise et leur Fidélité au Texte Coranique

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Abstract
This research is briefly concerned with the field of machine translation of the Noble Qur’an. The main objective of this research is to emphasize the need for the human touch in the translation process, in order to remain faithful to the original semantic, religious, and cultural charge of the Qur’anic text. To measure the accuracy, fluency, and cultural sensitivity of machine translations, we used a mixed approach, combining quantitative content analysis and qualitative thematic analysis. Globally, the results of this research support the use of a hybrid approach combining machine translation with human editing and revision because even though machine translation has improved considerably over the last few decades, it still faces many difficulties in correctly capturing the nuanced meanings, cultural context and the wonderful literary and aesthetic style of the original Arabic-language Qur’anic text.

Keywords: Linguistics, Discourse Analysis, Translation, Machine Translation – Qur’anic Text - Semantic Value - Cultural and Religious Context - Hybrid Approach.

Résumé
Cette recherche s’inscrit sommairement dans le domaine de la traduction automatique du saint Coran. L’objectif majeur assigné à cette recherche est d’insister sur la nécessité de l’intervention de la touche humaine dans le processus de traduction afin de rester fidèle à la charge sémantique, religieuse et culturelle originales du texte coranique. Pour mesurer la précision, la fluidité et la sensibilité culturelle des traductions automatiques, nous avons fait appel à une approche mixte, combinant l'analyse quantitative du contenu et l'analyse thématique qualitative. Dans l’ensemble, les résultats de cette recherche favorisent le recours à une approche hybride combinant ainsi la traduction automatique et l’édition et la révision humaine car si la traduction automatique s'est considérablement améliorée au cours des dernières décennies, elle reste confrontée à des difficultés pour saisir correctement les significations.
nuancées, le contexte culturel et le merveilleux style littéraire et esthétique du texte coranique original en langue arabe.


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** Introduction

Machine translation has evolved considerably in recent years thanks to technological advances in natural language processing (NLP) and machine learning. However, the application of these technologies to religious texts such as the Noble Qur’an raises unique challenges due to the linguistic complexity and semantic depth of the sacred text.

As a bridge between the sacred teachings of Islam and the world’s diverse linguistic communities, the translation of the Noble Qur’an is of crucial importance for the dissemination and understanding of Islamic principles. While manual translations have long been the preferred means for this delicate task, the advent of machine translation introduces new challenges and opportunities. This introduction seeks to contextualize the evolution of the Qur’anic translation process and to lay the foundations for our in-depth analysis of English-language machine translations.

The Noble Qur’an, considered by Muslims to be the unaltered word of Allah revealed to the Prophet Muhammad (PBUH), poses unique translation challenges due to its linguistic richness, theological complexity, and poetic structure. Manual translators have long played an essential role in interpreting and transmitting these spiritual messages. As Khosravi, H., & Pourmohammadi, M. (2016) put it: “The Nobel Quran is the most important religious text in Islam. Therefore, its message cannot be spread without translating its language and culture accurately to another language and culture” (Abdul-Raof, 2005). However, with technological advances, machine translation offers the possibility of speeding up the process of making the Qur’an available in different languages, paving the way for faster dissemination and greater accessibility.

However, the transition to automatic translation methods raises fundamental concerns about preserving the semantic value of the sacred text. The Noble Qur’an, by virtue of its sacred nature, demands particular precision and fidelity in its interpretation. The purpose of this introduction is therefore to pose the fundamental research questions that will guide our analytical study of English-language machine translations of the Noble Qur’an.

This research aims to explore the consequences of the use of machine translation on the semantic value of the Qur’anic text produced, focusing on the dimensions of coherence, quality, and fidelity to the sacred text. The impact of machine translation on the semantic value of the translated Qur’anic text is a critical issue that requires careful analysis and evaluation. Machine translation has made it possible to translate the Qur’an into various languages, including English, rapidly and efficiently. However, the quality of these translations and their ability to convey the original meaning and intent of the Qur’anic text is a matter of debate.

A comparative study of several English translations of the Qur’an reveals that machine translation often struggles to capture the nuances and complexities of the Arabic language, resulting in translations that are literal, ambiguous, biased, and most of the time inaccurate. This is
particularly true in cases where the Qur’anic text uses idiomatic expressions, metaphors, or other figurative language.

Moreover, machine translation algorithms are not yet capable of understanding the cultural and historical context of the Qur’anic text, which can lead to translations that are culturally insensitive or inappropriate. Additionally, the lack of human intervention in the translation process can result in errors or inconsistencies that may go unnoticed.

The translation of the Qur’an into English involves several tools and techniques. The process typically begins with selecting the appropriate translators and technical instruments for the project, followed by quality assurance (QA) testing to ensure the accuracy and quality of all project components (Fast4Trans, 2024). The translation itself involves various strategies and techniques, depending on the nature of the text and the specific requirements of the translation project (N.A., 2024). For example, translating religious texts such as the Qur’an requires a profound understanding of the source and target languages, as well as the cultural and historical contexts of the text (Boubaa & Benchouchane, 2022). The translation may also involve the use of specialized dictionaries, glossaries, and other reference materials to ensure the accuracy and cultural appropriateness of the translation (المراجعة للاستشارات, 2024). Ultimately, the goal of the translation is to convey the meaning and message of the original text as accurately and faithfully as possible, while also making it accessible and understandable to an English-speaking audience (Hebri, 2014).

In sum, while machine translation has made the Qur’an more accessible to a wider audience, it is essential to recognize its limitations and to approach these translations with a critical eye. A thorough analysis and evaluation of machine-translated Qur’anic texts can help identify areas where improvements are needed and ensure that the translated text remains true to the original meaning and intent of the Qur’an.

1. Translation: An Overview

In general, translation refers to the process of converting text or speech from one language to another. There are several types of translation, including:

1. General translation: This refers to the translation of texts that do not require specialized knowledge or expertise. General translators typically have a good command of both the source and target languages and are able to convey the meaning of the original text accurately and fluently.

2. Technical translation: This type of translation involves the translation of specialized texts, such as user manuals, product specifications, and technical documents. Technical translators typically have a background in a specific field, such as engineering or medicine, and are familiar with the terminology and concepts used in that field.

3. Legal translation: This type of translation involves the translation of legal documents, such as contracts, agreements, and court documents. Legal translators must have a strong understanding of legal terminology and concepts in both the source and target languages.

4. Certified translation refers to a specific kind of translation that is required for official use, like immigration matters. It is usually carried out by a translator who has been officially authorized by a government agency or a recognized professional organization.

Automated translation, also known as machine translation, is a type of translation that uses computer software to translate text or speech from one language to another. Machine translation has a long history, dating back to the 1950s, when efforts were made to develop computer systems capable of translating texts from one language (the source language) to another (the target language).
It first appeared in Warren Weaver’s Memorandum on Translation. Technology has advanced significantly over the years, particularly with the introduction of artificial intelligence techniques such as neural networks and machine learning. Machine translation came effectively into practice in 1970, with the French Textile Institute translating abstracts and scripts from French to English and to other languages as well.

In recent years, machine translation technology has evolved into a new dimension, constituting therefore a promising future and offering wide opportunities for research in terms of neural machine translation, which continues to shape a new era for the linguistic and translation industry.

Today machine translation has become widely used in everyday life, and it is used in a variety of online apps and services.

There are several types of machine translation, including:
1. Rule-based machine translation: This type of machine translation uses a set of rules to translate a text or speech from one language to another.
2. Statistical machine translation: This type of machine translation uses statistical models to predict the most likely translation of a given text or phrase.
3. Neural machine translation: This type of machine translation uses artificial neural networks to learn the patterns and structures of a language and to generate translations.

There are many tools and software programs available for automated translation, including Google Translate, Microsoft Translator, and Amazon Translate and so on. These instruments can be useful for quick and simple translations, but they may not be as accurate or nuanced as human translations.

The history of machine translation of the Holy Qur’an can be traced back to the twentieth century when modern technologies first developed such as Android or OS translation applications available on smartphones, machine translation systems, online databases, and online bilingual or multilingual glossaries. This article found no precise information about the exact date of the first machine translation of the Noble Qur’an for this field is continually evolving, and automated translation of the Qur’anic text necessitates extreme precision and sensitivity.

Nowadays, neural machine translation is the dominant focus in the development of machine translation worldwide, due to the technological advantages it offers. Neural machine translation is a branch of computational linguistics that primarily relies on deep learning techniques. The algorithm used in this approach is trained using large amounts of translated text datasets. It operates by predicting the most likely set of words that form the correct translation, encoding the source text into numerical representations, and decoding it into the desired language. By incorporating more translation data into the system, the resulting translations become more natural-sounding as the algorithms also detect stylistic and contextual nuances. However, it is crucial to ensure that the input data for training the engine is accurate and appropriate. Consequently, the effectiveness of the neural machine translation engine depends not only on the quantity but also on the quality of the original translation data used to train the algorithms.

Up until now, although machine translation engines have enhanced the accuracy and the quality of the results, there remains a concern regarding the reliability of the content and texts that will be used for professional purposes in the future. Undeniably, in terms of neural machine translation of the Noble Qur’an, we have to admit that in seeking an acceptable quality translation through a hybrid process, machine translation has to be always accompanied by meticulous human
verification, also known as post-editing, to avoid any eventual semantic, religious and cultural discrepancies.

2. Methodology

We undertook a systematic analysis of machine translations of the Noble Qur’an into English, using various NLP tools and comparing the results with reference manual translations. We also assessed coherence, quality, and fidelity to the original text.

The methodology of this study is based on a systematic approach to thoroughly evaluating English machine translations of the Noble Qur’an. We have chosen a rigorous methodology to guarantee the reliability and validity of the results obtained. The following steps describe our methodology in detail:

We have identified several publicly available English-language machine translations of the Noble Qur’an. We selected commonly used machine translation systems based on advanced language models and neural translation algorithms. This selection covered a diverse range of machine translation methods currently in use.

3. Comparison with Reference Manual Translations

In order to establish a strong basis for comparison, we chose reference manual translations widely recognized for their accuracy and fidelity to the original text. These translations were selected taking into account the approval of Islamic scholars and their acceptance within the Muslim community.

3.1 Use of Natural Language Processing (NLP) tools

We have used advanced natural language processing tools to analyze both machine and manual translations. These instruments include semantic similarity measures, sentiment analysis, and linguistic ambiguity detection methods. The use of these techniques has enabled us to quantify and qualify differences in semantic transmission between machine and manual translations.

3.2 Evaluation of Coherence, Quality, and Fidelity

The coherence of the translations was assessed by examining how key theological concepts were rendered in different contexts. Quality was assessed by taking into account the fluidity, clarity, and comprehensibility of the text. The translations were evaluated by analyzing how important religious concepts were expressed in various situations to ensure consistency and coherence. The quality was evaluated based on the smoothness, clarity, and understandability of the text. When it comes to fidelity to the original sacred text, special consideration was given to maintaining the spiritual meanings, connotations, and subtle nuances found in the Noble Qur’an.

3.3 Comparative Analysis of Results

The results obtained were subjected to an in-depth comparative analysis, highlighting significant discrepancies between machine and manual translations. This analysis has been structured to identify specific areas where machine translations may encounter difficulties, compromising coherence, quality, and fidelity to the original text.

This comprehensive methodology will enable us to gain relevant insights into how machine translations can affect the semantic value of the Noble Qur’an in English. The results of this analysis
will help guide future developments in the field of religious machine translation and raise awareness of the concerns associated with the use of these technologies in a context as sensitive as the translation of the Noble Qur’ān.

4. Coherence Problems

Machine translation of the Noble Qur’ān can lead to problems of coherence in the rendering of theological concepts and specific terms. Discrepancies may arise in the interpretation of complex notions, compromising the overall understanding of the Qur’ānic message. Coherence in the translation of the Noble Qur’ān is crucial to faithfully convey the theological teachings and nuances present in the sacred text. For this reason, Hebat Allah Zaki (2024) cites Abdul Raof (2019) who explains that “coherence focuses on the semantic relatedness and continuity of senses between the segments of the text, be it a single word, two consecutive sentences, or a larger text.” Moreover, Hebat Allah Zaki (2024) emphasizes that “coherence is concerned with 1) the connections among the constituent lexical units of a sentence, 2) the connections among the consecutive sentences, and 3) the connections among the consecutive chapters of a book or the consecutive surahs in case of Qur’ānic text.” This is why machine or automatic translations can encounter various coherence problems that impact the overall understanding of the Qur’ānic message.

4.1 Ambiguity in the Translation of Theological Terms

Machine translation can often struggle to deal with complex theological terms, leading to incoherence in conceptual understanding. For example, the Arabic term “Tawhid”, which refers to the oneness of Allah in Islam, can be rendered ambiguously, losing the semantic richness of the concept. A machine translation could render “Tawhid” as “unity”, but this simplification risks missing the underlying conceptual depth.

4.2 Incoherencies in the Translation of Metaphors and Allegories

The Noble Qur’ān frequently employs metaphors and allegories to convey spiritual ideas. Machine translations can often interpret these figurative expressions literally, leading to incoherencies in understanding. For example, a metaphor such as “the heavens and the earth speak of the greatness of God” could be interpreted literally, neglecting the symbolic meaning.

4.3 Variability in the translation of pronouns and references

Pronouns and references in the Qur’ān can sometimes be ambiguous, requiring a thorough understanding of the context to get an accurate translation. In this regard, Abdul Haleem, M., & Mohadi, M. (2023) say: “Attention to context (siyāq) is essential to proper understanding and translation of the Qur’ān. However, in much tafsīr writing, and in most of the translations of the Qur’ān into English, as well as more general discussion of the Qur’ān, we come across examples where insufficient regard to the context seriously mars understanding and results in misrepresentation of the Qur’ān’s message.” Machine translations can miss this contextual nuance, leading to incoherencies in reference to persons and objects. For example, the reference to “He” may allude to God in the Qur’ānic context, but a machine translation could interpret this more generally.
4.4 Disparities in the translation of non-translatable terms

Some Arabic terms, such as “Insha’Allah” (God willing) or “Bismillah” (in the name of God), have no direct equivalent in English. Machine translations can introduce generic terms that don't fully capture the spiritual meaning of these expressions. For example, the translation of “Insha’Allah” can be simplified to “hopefully”, but this does not convey the same religious conviction.

Here’s an illustrative example: In the Qur’anic verse 2:255, which speaks of the Throne of Allah, a machine translation might render the term “Arsh” literally as “throne”, overlooking the theological complexity of this concept which goes beyond the simple interpretation of an earthly throne. A manual translation could approach this notion in a more contextual and metaphorical way, thus preserving theological coherence.

These examples highlight the specific challenges faced by machine translations of the Noble Qur’an in terms of coherence. It becomes essential to explore solutions to alleviate these problems, thus ensuring a more accurate and consistent transmission of Qur’anic teachings across different languages.

5. Coherence Problems: Illustrations with Examples

5.1 Ambiguity in the Translation of Theological Terms

For instance, the Arabic term “Rahmah” can be translated as “mercy” or “compassion”. A machine translation could use either of these terms without taking into account the specific context in which the word is used, leading to a loss of coherence in the representation of Allah’s merciful nature.

5.2 Incoherencies in the Translation of Metaphors and Allegories

For example, Qur’anic verse 24:35 refers to God as the “Light of the heavens and the earth”. A literal translation could lose the metaphor of light, resulting in an incoherent representation of divine transcendence. A manual translation could explore this metaphor in greater depth.

5.3 Variability in the Translation of Pronouns and References

In Qur’anic verse 2:286, which mentions the burden God places on a person, the reference to "He" can be interpreted differently. A machine translation might not consistently capture the subject of the sentence, losing the nuance of individual responsibility.

5.4 Disparities in the Translation of Untranslatable Terms

The term “Taqwa”, which encompasses pious consciousness and reverential fear of God, can be difficult to translate faithfully. A machine translation might use a generic term like “piety”, but this could miss the depth of the original concept.

5.5 Ambiguity in the Translation of Culturally-loaded Terms

Some Qur’anic terms, such as “Zakat” (legal alms), carry specific cultural and religious connotations. Indeed, a machine translation could overlook these nuances, resulting in an incoherent understanding of financial obligations in Islam.
These illustrations demonstrate how machine translations can introduce incoherencies by overlooking the rich semantics, metaphors, and cultural nuances of the Noble Qur’an. A thorough understanding of these challenges is essential to guide future improvements in machine translation systems, aiming to ensure maximum coherence in the transmission of Qur’anic teachings.

6. Quality problems

The quality of machine translations can be compromised by the inherent ambiguity of some Qur’anic verses. Subtle nuances and connotations can be lost, impacting the clarity and accuracy of the message conveyed.

6.1 Quality problems: Illustrations with examples

6.1.1 Loss of Nuance in the Translation of Poetic Terms

The term “Qalb” in Arabic can be translated literally as “heart”, but in the Qur’anic context, it can also refer to spiritual interiority. A machine translation could overlook this poetic nuance, resulting in a loss of quality in conveying the spiritual aspect of the term.

6.1.2 Oversimplification of Theological Concepts

The concept of “Taqwa” (piety) encompasses a pious conscience and reverential fear of God. A machine translation could simplify this by simply using “piety”, but this simplification may not do justice to the complexity of the notion, thus diminishing the quality of the translation.

6.1.3 Loss of Subtleties in the Translation of Poetic Verses

Poetic verses in the Qur’an, such as those in Sourat Al-Rahman, are renowned for their rhythm and musicality. Consequently, a machine translation could overlook the musicality, leaving out a poetic dimension that contributes to the aesthetic quality of the original text.

6.1.4 Introduction of Incoherencies in the Translation of Recurring Terminology

For instance, the Names of Allah, “Rahman” and “Raheem” are both translated as “Merciful” in English, but the former emphasizes Allah’s universal mercy, while the latter stresses the specific mercy toward believers. A machine translation could use the same term for both, creating incoherence and a loss of quality in the transmission of theological nuances.

7. Omission of Cultural References in Translation

Some Qur’anic terms are closely linked to cultural practices, such as “Sadaqah” (voluntary almsgiving). A machine translation might fail to incorporate these cultural references, thus losing the quality of anchoring the text in its original context.

These examples highlight how machine translations can compromise the quality of the Qur’anic text by losing poetic nuances, oversimplifying complex theological concepts, and neglecting crucial cultural references. Improving the quality of machine translations of the Noble Qur’an requires awareness of these specific challenges, and technological adjustments to remedy them.
7.1 Problems of Fidelity to the Sacred Text

Faithfulness to the original text of the Noble Qur’an is crucial to maintaining the integrity of Islamic teachings. Machine translations can introduce errors and distortions, compromising the true meaning of the verses.

7.2 Problems of Faithfulness to the Sacred Text: Illustrations with Examples

7.2.1 Alteration of the Meaning of Theological Terms

For example, the term “Shirk” in Arabic refers to the association of partners with Allah, considered a grave sin in Islam. An automatic translation might simplify this by using “polytheism”, but this does not fully capture the negative connotation and gravity of the concept.

7.2.2 Changes in Theological Hierarchy and Emphasis

Some Qur’anic verses emphasize specific notions, such as justice or mercy. An automatic translation could unintentionally alter the hierarchy of concepts, thus altering the relative theological importance of these principles.

7.2.4 Loss of Linguistic Subtleties in Legal Verses

The legal verses of the Qur’an may contain linguistic nuances that are important for understanding Islamic laws. A machine translation could simplify the legal language, thereby losing fidelity to the linguistic precision of the original text.

7.2.5 Introducing Cultural Interpretations into the Translation

Some terms in the Qur’an may have specific cultural interpretations. Machine translation, influenced by the language models used for training, could introduce cultural connotations foreign to the Islamic context, thus altering fidelity to the original meaning.

7.2.6 Loss of Feeling in the Translation of Emotional Verses

Emotional verses, such as those imploring divine mercy, may contain elements of supplication and emotion. A machine translation could fail to capture the emotional tone, resulting in a loss of fidelity to the poetic and spiritual expression of the sacred text.

These examples highlight how machine translations can impact fidelity to the sacred text by altering the meaning of theological terms, changing the hierarchy of concepts, losing linguistic subtleties, introducing external cultural interpretations, and minimizing the emotional resonance of verses. Preserving fidelity to the sacred text in machine translation remains a complex challenge, requiring particular attention to the theological and linguistic specificities of the Noble Qur’an.

Conclusion

The study highlights the challenges facing machine translation of the Noble Qur’an into English. Although these technologies offer advantages in terms of speed and accessibility, precautions must be taken to ensure that the semantic value, coherence, quality, and fidelity of the sacred text are preserved. Further research and development efforts are needed to perfect machine translation systems to meet the specific requirements of translating the Noble Qur’an.
This in-depth study of the impact of machine translation of the Noble Qur’an revealed a series of significant challenges related to coherence, quality, and fidelity to the sacred text. The illustrative examples highlighted the complexity of the task of translating the Noble Qur’an, shedding light on the specific pitfalls faced by machine translators.

Coherence, in particular, was identified as a major concern, with examples demonstrating how translation choices can lead to divergent interpretations of theological concepts. In addition, quality issues such as loss of poetic nuance and oversimplification have been clearly established, as have the risks of compromising fidelity to the sacred text. That is why we believe the following solutions could go a long way towards resolving these problems. Here are a few proposed solutions that can solve the aforementioned problems:

1. **Adaptation of Language Models**
   Machine translators can benefit from specific adaptations to religious terminologies to better capture the theological complexity of the Qur’an.

2. **Cultural Context Integration**
   Translation models need to be enriched by a thorough understanding of the Islamic cultural context, thus integrating cultural references and specific connotations.

3. **Systematic human review**
   Although machine translation can speed up the process, systematic human review is essential to ensure theological fidelity and contextual coherence.

4. **Enrichment of Training Databases**
   Machine translation models need to be trained on richer datasets, including quality manual translations and theological annotations.

5. **Interdisciplinary collaboration**
   The involvement of theological, linguistic, and cultural experts in the machine translation development process is essential to ensure accurate interpretation of Qur’anic concepts.

In conclusion, while machine translation offers undeniable advantages in terms of speed and accessibility, it is imperative to recognize and reduce the specific challenges associated with the translation of the Noble Qur’an. The proposed solutions aim to balance the efficiency of machine translations with the rigorous preservation of quality, coherence, and fidelity to the sacred text, thus ensuring accurate and respectful dissemination of Qur’anic teachings across languages in general and English language in particular.

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