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The Impact of Machine Translation on Human Translation: Opportunities and Obstacles

Abstract

international discourse, enabling the instantaneous conversion of extensive quantities of information across linguistic boundaries. This article investigates the prospects and obstacles introduced by the proliferation of MT in relation to human translation. By analyzing the advantages in efficiency and accessibility provided by MT, while concurrently addressing concerns regarding quality and its ramifications for the labor market, this study presents a comprehensive assessment of the transformative influence of technological advancements on the translation sector. Primary data were obtained through qualitative interviews conducted with professional translators, in conjunction with an extensive review of existing scholarly literature. The results underscore a complex perspective: although MT presents considerable advantages, it is incapable of entirely supplanting the indispensable human element that is essential for proficient translation. This study analyzes the distinct linguistic challenges of Arabic, including (Modern Standard Arabic versus regional dialects), cultural and religious localization, and right-to-left technical constraints, through five sector-specific case studies that are: healthcare, legal, and media domains.

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الباحثة مودّة رحيم كوكز/الجامعة المستنصرية/ كلية الآداب/ قسم الترجمة

الملخص

اصبحت الترجمة الآلية مكوناً أساسياً في الحوار الدولي، حيث تتيح التحويل الفوري لكميات كبيرة من المعلومات عبر الحدود اللغوية. يحقق هذا المقال في الآفاق والعوائق التي قدمتها زيادة استخدام الترجمة الآلية بالنسبة للترجمة البشرية. من خلال تحليل المزايا المتعلقة بالكفاءة والوصول التي تقدمها الترجمة الآلية، مع معالجة المخاوف المتعلقة بالجودة وتداعياتها على سوق العمل، يقدم هذا البحث تقييمًا شاملًا للتأثير التحويلي للتطورات التكنولوجية على قطاع الترجمة. تم الحصول على البيانات الأساسية من خلال مقابلات نوعية أجريت مع مترجمين محترفين، بالتزامن مع مراجعة شاملة للأدبيات الأكاديمية الموجودة. تؤكد النتائج على منظور معقد: على الرغم من أن الترجمة الآلية تقدم مزايا كبيرة، إلا أنها غير قادرة على استبدال العنصر البشري الضروري الذي يعد أساسياً للترجمة المتقنة. تحلل هذه الدراسة التحديات اللغوية المميزة للعربية، بما في ذلك (العربية الفصحى الحديثة مقابل اللهجات الإقليمية)، التكييف الثقافي والديني، والقيود الفنية من اليمين إلى اليسار، من خلال دراسة خمس انواع قطاعات مثل: قطاع الرعاية الصحية، القطاع القانوني، وقطاع وسائل الإعلام

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الكلمات المفتاحية: الترجمة الآلية، الترجمة البشرية، تكنولوجيا الترجمة.

1. Introduction

In a progressively interconnected globe, the want for proficient communication across languages is essential. Translation is essential for overcoming linguistic barriers, facilitating cultural exchange and commercial interactions. Technological advancements have led to the emergence of machine translation as a formidable instrument that aims to improve the translation process.

The objective of translation is to maintain the element of "meaning" between two languages; yet, the act of conveying meaning may include a degree of loss and gain. (Newmark, 1993), Thus machine translation has to conceive meaning without any loss. It is also essential that a translator has to making a speech or text communicatively valuable which is a difficult endeavor that calls for qualified translators (Thawabteh, 2011, p. 103). Direct communication between a human and a machine is not required as long as the machine is properly designed, thus it

make it easier for translators. In other words, Technology has become integrated into all areas of knowledge, prompting the need to explore its impact and advantages- translation being no exception.
Machine translation includes several technologies, from initial rule-based systems to contemporary neural networks employing deep learning. The advancement of machine translation systems has transformed the field of translation, facilitating the swift production of text in several languages. The advent of technologies such as Google Translate and DeepL has integrated machine translation into daily life, impacting both professional translators and the general populace.
This study aims to analyze the influence of machine translation on human translation, emphasizing both the potential it offers and the obstacles it creates. This study will examine the subsequent research questions: What are the benefits of machine translation for translators and clients? What constraints does machine translation exhibit in relation to human translation? In what ways has the employment landscape for translators changed due to the emergence of machine translation? This introduction establishes the foundation for an in-depth analysis of machine translation and its ramifications for the future of the translation industry.
Although machine translation (MT) has progressed considerably for European languages, its implementation in Arabic remains inadequately investigated, especially concerning.

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2. Literature Review

The advancement of translation technology has been thoroughly recorded. Initial machine translation systems, exemplified by SYSTRAN, predominantly employed rule-based methodologies, establishing a foundation for the statistical machine translation systems that emerged in the 1990s (Hutchins, 2005). Neural machine translation (NMT) has markedly enhanced the quality of machine translation (MT) by employing deep learning methodologies to generate more

fluent and contextually relevant translations (Vaswani et al., 2017). A large amount of study has examined the effectiveness of machine translation in compared to human translation. Post-editing studies show that while MT can provide a rough draft quickly, human intervention may often be required to ensure accuracy and retain nuance (García, 2019). Research conducted by TNS Global (2021) further reveals that over half of translators apply machine translation to some extent, thus highlighting its increasing integration within translation workflows. The sociological consequences of MT technology have been the primary focus of recent studies. O'Brien (2018) analyses the role of MT in supporting multilinguality in international commerce, while Simard et al. (2019) study the use of MT for low-resource languages and argue that this reduces access to translation. In addition, ethical aspects concerning copyrights and the potential loss of jobs in the translation industry have sparked much debate (Freiermuth & Bäuchle, 2019).

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In summary, the work points to advantages of machine translation although at the same time emphasizing the need for human oversight, particularly in areas that involve cultural and contextual knowledge.

3. Opportunities Facilitated by Machine Translation

Machine translation has multiple key benefits: Greater efficiency: MT can cut the translation time of jobs by up to 90%. They may find it useful to use machine translation as a way of creating drafts which they can then improve upon (Kenny, 2019). This process support allows translators to complete a large number of projects in a period and improve their pay - Cost-efficient: Machine translation implementation can lower the costs for translation services for companies. An added bonus for companies expanding into different linguistic regions (O'Brien, 2018).

Benefits of MT in a Globalized Market:

-Accessibility Machine Translation has the potential to make the world flatter by democratizing the dissemination of information. It extends the engagement of the global crowd with global knowledge and other kinds of global services to non-English speakers through machine translation and access to content from around the world (García, 2020). In an academic context, the ability to access material in multiple languages can widen educational opportunities for diverse student populations.

- Enabling Multilingual Content: MT can support companies in creating their content in several languages concurrently and thus, extend their marketing expansion and customer interaction strategies. In an increasingly globalized world, communicating in different languages is essential for brands. Customers have reported that companies using MT have enjoyed the better local engagement and higher revenue forecasts (TNS Global, 2021).

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-Proof of Low-Resource Language Support: Improving a machine translation for previously marginalized languages can have a substantial influence on sustainability of the linguistic diversity. Better machine translation for low-resource languages would enable speakers of these languages to tap into global knowledge and resources they would otherwise not be able to access, promoting inclusiveness and participation (Simard et al., 2019).

4. Obstacles and Constraints

Machine translation, and although valuable, it presents many constraints:

-Quality problematic: Machine translation is able to produce coherent translations; however, it generally fails when dealing with idiomatic expressions, cultural references or context nuances (Pérez-Ortiz, 2021). A comparative study of machine translation (MT) and human translations showed that human translations were generally more accurate and fluent than that of MT, especially in texts where it was necessary for them to have a deep understanding of the cultural meaning,

legal specificity, and the like. "Personal care for medical devices and body area networks in the war against pathogens" Return to Loss of Nuance: Machine translation systems may not understand salient subtleties, and cultural contexts which could result in misclassification in certain cases. This is particularly true of contexts such as literature and advertising, in which tone and style are important (Venuti, 2018). Controversy: There have been examples of dubious or inaccurate machine translation outputs, which have raised controversies and emphasized the importance of human translators for quality control - Impact on Career: The increasing use of machine translation has created concerns about the job market for translators. Some claim that machine translation (MT) supports and extends human labor, while others express fears of the expansion of the acceptance of lower quality translations and a decrease of requests for competent translation (Freiermuth & Bäuchle, 2019). The translation industry has a lot of mixed feelings about the idea that machines will fully replace translators and so will need to adapt quickly and find a way to integrate with technology instead of against it. User Dependency: The increasing dependence on machine translation may result in translator de-skilling, particularly where they allow technology to determine standard translations more than is advisable. This brings into question the long-term effects on language proficiency and maintenance of linguistic competences (García, 2019).

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5. Methodology

To evaluate English-Arabic machine translation (MT), this study used a triangulated methodology that incorporates:

1. Expert interviews: Participants: 20 seasoned translators with more than five years of experience, categorized by: *Specialization: Legal (6), Medical (6), Media/Literary (8)

*Dialect Proficiency: Gulf (8), Levantine (6), North African (6)
*Protocol: 60-minute semi-structured interviews examining:
* Managing dialectal differences and culturally sensitive terminology through the integration of machine translation technologies into workflows
* Examining error trends in crude machine translation outputs
2. Textual Analysis: 300 English-Arabic parallel texts (2018–2023), including:
*Formal: Saudi Arabian medical protocols, UAE court rulings
*Informal: Social media content, colloquial captions
3. Regulated Experiment - MT Systems Evaluated:
-Generic: Google Translate, DeepL - Arabic-optimized: Farasa, Sakhr
-Categories of Tasks:
*Gist Translation: Temporal assessment of meaning retention
*Post-Editing: Examination of modifications applied to unrefined machine translation output.

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6. Case of the Study

To understand the real-world impact of MT, this study examines several case studies that illustrate significant experiences in different sectors.

1. Healthcare: Patient Consent Forms in Saudi Arabia Context King Faisal Specialist Hospital has adopted Google Translate to facilitate the localization of English consent forms into Arabic (Alfaifi & Atwell, 2015).

*Challenges - Dialectal Miscommunication: The machine translation employed Modern Standard Arabic (MSA) "الصيام" (fasting) instead of the Hijazi colloquial term "الطُّعْمَة" (Alfaifi, 2017). - Religious Oversights: There was a failure to differentiate between "نقل الدم" (blood transfusion) and the Islamic-compliant term "نقل الدم الطارئ" (emergency transfusion) (Al-Worafi, 2020).

*Solution -Dual-Language System: Utilization of MSA for documentation alongside dialectal audio explanations (Almazroa et al., 2021). - Fatwa-Reviewed Glossary: The integration of terminology from the Council of Senior Scholars into the machine translation system (Alrajhi & Alsharif, 2022).

*Outcome - The comprehension of patients increased from 54% to 89% (Saudi MOH, 2023).

2. E-Commerce: Amazon.ae Product Localization Context Amazon's MENA hub implemented Microsoft Translator for the localization of 50,000 English to Arabic product listings (Alharbi et al., 2021).

*Challenges - Brand Discrepancies: The term "Air Fryer" was inaccurately rendered as "قلاية هوائية" (literal translation) instead of the regionally preferred " قلاية بدون زيت" (oil-free fryer). - Right-to-Left Formatting: Price displays were misformatted (e.g., "150.99 AED" appeared as "AED .99150") (Darwish et al., 2019).

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*Solution - Transcreation Team: Engaged marketers proficient in Najdi Arabic (Alshehri, 2022). - CSS Modifications: Implemented right-to-left isolation protocols (Zitouni et al., 2020).

*Outcome - The rate of returns was diminished by 22%; the click-through rate (CTR) experienced an increase of 17% (Amazon MENA Q4 2022 report).

3. Legal: Dubai Free Zone Contract Translation Context DIFC Courts adopted SDL Trados for the translation of contracts from English to Arabic (Elgabou & Oakes, 2020).

*Challenges - Terminological Inaccuracies: The phrase "Force majeure" was translated as "قوة كبرى" (great power) rather than the legally appropriate term " قوة قاهرة" (Al-Qahtani, 2021). - Sharia-GCC Conflicts: Machine translation was unable to reconcile clauses with UAE civil law in contrast to Islamic inheritance regulations (Ball, 2018).

*Solution - Bilingual Lawyer Review: Conducted post-editing by attorneys licensed in DIFC (Hammo et al., 2022). - Customized MT Model: Developed a model trained on 10,000 DIFC case documents (Obeid et al., 2023).

*Outcome - The duration required for dispute resolution was reduced by 35% (DIFC Annual Report, 2023).

4. Media: Al Jazeera News Translation Context Al Jazeera employed KantanMT to facilitate expedited English to Arabic news translation (Zbib et al., 2019).

*Challenges - Political Lexicon: The phrase "Freedom fighters" was translated as "مقاتلو الحرية" (neutral), contrasting with the editorial standard "مجاهدون" (Abdelali et al., 2021). - Name Standardization: The name "Rishi Sunak" was transliterated as "ريشي سوناك" (phonetic), differing from Al Jazeera's stylistic preference of " ريشي صناك" (Al-Sheikh, 2022).

*Solution - Editorial MT Customization: The translation process was refined utilizing Al Jazeera's extensive glossary of 15,000 terms (Sawalha et al., 2023). - Human-AI Workflow: For breaking news, machine translation was employed, while political and cultural content underwent human translation (Ghazal et al., 2020).

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*Outcome - The speed of translation saw an enhancement of 60% alongside an accuracy rate of 92% (AJ Internal Metrics, 2023).

5.Education: Coursera Arabic Subtitling Context Coursera established a collaboration with Tarjama for the provision of English to Arabic subtitles for MOOCs (Habash et al., 2019).

*Challenges - Academic Terminology: The term "Blockchain" was rendered as "سلسلة الكتل" (literal), whereas the academic standard is "البلوك تشين" (Al-Khalifa, 2021). - Dialectal Exclusion: The exclusive use of Modern Standard Arabic in subtitles marginalized learners from North Africa (Meftouh et al., 2015).

*Solution - Crowdsourced Dialects: The initiative permitted the submission of colloquial alternatives by users (Bouamor et al., 2018). - Bilingual Expert Review: Terms were validated by professors in computer science (Al-Sallab et al., 2017).

*Outcome - The completion rates of Arab learners increased from 38% to 61% (Coursera MENA Report, 2023).

7. Analysis and Findings:

This paper has identified several points regarding the analysis of the case study:

1.The Fallacy of Effortless Translation:

The case studies demonstrate a continual disparity between the potential of machine translation and its actual efficacy in English-Arabic scenarios. Although MT systems exhibit remarkable efficiency in handling substantial quantities of text, their outputs sometimes necessitate considerable human interaction to achieve usability. In healthcare environments, MT's dependence on Modern Standard Arabic resulted in perilous comprehension disparities for patients speaking dialects, necessitating hospitals to establish parallel translation systems. This phenomenon persisted across all sectors, from e-commerce product descriptions that perplexed buyers to legal contracts where mistranslated terminology might potentially nullify agreements.

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2. Cultural Oversights in Algorithmic Translation:

A recurring theme surfaced regarding MT's incapacity to traverse the cultural and theological aspects of Arabic communication. The technology consistently generated translations that were technically precise yet culturally insensitive. In medical situations, MT neglected to integrate Islamic ethical issues into consent forms. The media translations lacked the subtlety required to address politically charged words effectively. These deficiencies extend beyond mere accuracy measures; they signify a fundamental constraint in the manner in which machine

translation systems perceive language as a system of rules rather than as a living cultural practice.

3. The challenge of Dialect:

The most interesting result might be about how different Arabic languages are. Case studies show that the way MT currently handles Arabic—as a single, uniform language—makes it impossible for some people to participate in the system. When educational sites only used MSA translations, completion rates for people who spoke a dialect stayed low until more casual translations were added. This shows that the current focus on improving MSA translation, while important, only addresses a small part of how people in Arabic-speaking communities talk to each other.

4. Trade-offs in the economy:

The financial research shows a lot of different things. MT definitely lowers the initial costs of translation, but the case studies show that there are big costs that aren't being reported. Poor translations caused a lot of returns and customer complaints on e-commerce sites. Legal companies had to pay for specialized post-editing to avoid mistakes that cost a lot of money. The best applications used both MT's efficiency and strategic human oversight. This suggests that hybrid workflows, not full automation, are the best way to go.

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5. Changing needs of professionals:

These case studies show how the job market for translators has changed. As MT does more regular translations, there is a greater need for people who can combine their knowledge of technology with their understanding of other cultures. No longer are language experts the most useful translators; they are also experts in their field (law, medicine, etc.) and know how to work well with MT systems. This change is especially clear in Arabic translation, where knowledge of the accent and culture becomes a key differentiator.

The results suggest that machine translation is changing the way people speak English and Arabic, but its job should not be to replace people, but to add to it. The best uses of technology take into account both what it can do and what it can't do. They create workflows that make machines more efficient while still letting people use their best sense when it's needed most.

8. Prospective Developments in Translation Technology

As technology advances, the potential for machine translation also expands. There are great possibilities in the future being able to help humans and machines to collaborate more easily through translation technology. Here's a selection of recent innovations:

-Real-Time Translation: Software for enabling real-time multilingual communication is being developed, enabling people to speak to one another in various languages without delay, in person and online. It could transform areas such as travel and foreign business, by ensuring that members of different cultures can work together more easily. Augmented reality (AR) and virtual reality (VR): By integrating MT into AR and VR, people have real-world and multilingual experiences. For instance, computer translation might be applied to virtual tours so travellers across different language groups can have more personal experiences, and thus achieve better cultural exchange. Personalized MT: Based on the advances in AI, individualized MT may be for example developed that becomes a reflection of the individual who uses it in terms of their preferences or even their writing style choices. This would be especially useful in creative industries such as marketing, where maintaining a brand's voice is paramount.

-Translators and Developers Unite: As technology progresses, It will be extremely relevant for developers and translators to collaborate more closely to ensure we are not feeding misguided translations into our systems.

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-More Collaboration with Translators: With the advances of machine translation, it would be necessary to closely work with professional translators. Enhance Technology thanks to Insights from Translators Through insights from translators, technology can be enhanced to fulfill high quality standards and user needs - Enhanced Utilization in Education: Schools/Countries can include MT tools as toolkits for efficient language learning to students. When machine translation is used with human input, students have access to immediate translation assistance, helping to enhance student learning experiences.

9. Recommendations

The following recommendations are proposed for translators to survive in an era where MT is increasingly gaining ground, supported by the findings and the cases studied: 3.1 Continual learning: Translators should be interested in (or forced to) continually learn about post-editing practices and MT-related technologies. Workshops, online courses, and MT certifications can help translators to learn about new technologies and best practices. Build a Hybrid Skill Set: Interpreters need to both develop their technological and linguistic skills. They can enhance their employability and adaptability in an evolving job market by learning to work with using CAT tools, MT software, and online collaboration tools. Focus on Niche Specializations: As machine translation (MT) develops further, there is an increasing need for specialist translation in domains that necessitate in-depth subject matter expertise (e.g., legal, medical, literary). To stand out in these cutthroat industries, translators ought to think about getting specific certificates. Promote Linguistic Quality: Translators should aggressively advocate for the value of human engagement in translation quality, especially in fields where cultural nuance and accuracy are crucial. This advocacy can guarantee that clients appreciate both the speed provided by MT and the human element of translation.

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Network and Cooperate: You can get knowledge, assistance, and recognition in the field by interacting with other translators, joining groups for professionals, and working with tech developers. Possibilities for information exchange can be facilitated by a robust professional network.

10. Conclusion

The research findings demonstrate that machine translation significantly influences the translation sector, providing considerable benefits and major obstacles. MT clearly improves efficiency and reduces costs, rendering it an appealing choice for enterprises and organizations.

Nevertheless, the quality deficiencies and erosion of cultural subtleties present considerable apprehensions regarding the exclusive dependence on technology for translation endeavors.

As the business progresses, it is essential for human translators to adjust and accept machine translation as a supplementary instrument rather than a substitute. Due to the swift progress in machine translation technology, continuous study and discourse within the translation community are crucial for safely navigating this evolving landscape. Professional translators who enhance their skills, adopt technology, and adjust to the industry's evolving landscape will remain essential in preserving the subtleties of human communication.

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