Simultaneous Interpreting in the Digital Era: Challenges and Opportunities

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الترجمة الفورية في العصر الرقمي: التحديات والفرص

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المستخلص

يهدف هذا البحث الى تقييم فاعلية استخدام انظمة الترجمة بمساعدة الحاسوب للترجمة الفورية، وكيف يؤثر ذلك على اداء الترجمة الفورية. فضلاً عن دراسة تأثير هذه الانظمة على دقة الترجمة. علاوةً على ذلك، يستكشف هذا البحث وجهات نظر وخبرات المترجمين الفوريين مع ادوات الحاسوب.

باستخدام منهجية نوعية، تبحث هذه الدراسة في عبارات معينة في سياق الابتكار التقني في الترجمة الفورية، مع التركيز على تطبيق نظام تحويل الكلام إلى نص

تشير هذه الدراسة إلى أن كفاءة الترجمة الفورية قد زادت بشكل كبير بفضل أنظمة الترجمة بمساعدة الكمبيوتر. أظهرت الأبحاث أن المترجمين الفوريين الذين يستخدمون أدوات الترجمة بمساعدة الكمبيوتر يقضون وقتا أقل في إعداد وتقديم الترجمة الفورية أثناء الجلسات. ميزات مثل النسخ في الوقت الفعلي والوصول إلى مصطلحات واسعة النطاق ، والتي تمكن المترجمين الفوريين من التركيز على توفير الترجمة الفورية اكثر من التركيز على البحث عن مصطلحات من شأنها ان تزيد في كفاءة الترجمة.

خلصت هذه الدراسة إلى أن الترجمة بمساعدة الكمبيوتر لديها القدرة على أن تكون جزءاً من الترجمة الفورية، لأن هذه التكنولوجيا تحسن الأداء العام من خلال تزويد المترجمين الفوريين بمزيد من الدقة والكفاءة والضغط المعرفي الأقل.

الكلمات المفتاحية: الترجمة الشفوية، التكنولوجيا، الترجمة بمساعدة الحاسوب، الترجمة الفورية، الترجمة التحريرية.

Abstract

This paper aims to assess the effectiveness of using computer-assisted interpreting (CAI) systems for simultaneous interpretation. and how it affects simultaneous interpreting (SI) performance. Additionally, it examines the impact of CAI systems on the accuracy of interpretation. Furthermore, this paper explores the experiences interpreters have with CAI tools.

Using a qualitative methodology, this study examines certain phrases in the context of technical innovation in simultaneous interpretation, with an emphasis on the application of the Speech-to-Text (STT) system.

The study's goal is to investigate the effects of these technologies on workflow, training, and interpreting performance. Using a qualitative, literature-based methodology, the study examines academic publications and case studies to pinpoint important patterns and ramifications. The results show that although technology improves efficiency and accessibility, it also poses problems with regard to cognitive load, technical dependability, and ethical issues. The study's conclusion emphasizes the necessity of revising ethical standards and training curricula to reflect the changing interpreting environment.

Keywords: *Interpretation, technology, computer-assisted interpreting, simultaneous, translation.*

1. Introduction

This study examines how technology affects the performance of simultaneous interpreting (SI), in particular in light of the development of speech-to-text (STT) and computer-assisted interpreting (CAI) systems. These developments give interpreters access to resources like terminology databases, machine translation, and speech recognition. Still up for debate, though, is how these tools affect SI speed, accuracy, and cognitive burden. Using a mixed-methods approach, this study aims to provide a thorough understanding of how technology developments have changed SI practice by combining qualitative examination of interpreter experiences with quantitative analysis of sample data. The results are intended to aid in the development of training programmes and best practices for interpreters working in electronically mediated settings.

Interpreters must comprehend and translate spoken language in real time when doing simultaneous interpreting, which is a cognitively taxing endeavor. The interpreting profession has changed significantly as a result of the quick development of digital technologies. The purpose of this essay is to examine the effects of these technical advancements, with a particular emphasis on remote interpreting platforms and computer-assisted interpretation (CAI) tools.

The branch of simultaneous interpreting has undergone a substantial transformation due to recent technological breakthroughs. In the area, computer-assisted interpreting (CAI) systems—which include a variety of hardware and software solutions—have grown in popularity (Hansen, 2016). With the goal of improving their accuracy and efficiency, these systems provide interpreters with a variety of tools and resources. For instance, translators no longer need to manually take notes when using speech recognition technology, which can automatically transcribe spoken content (Lee et al., 2020). Furthermore, instant translations of speech in the source language can be produced using machine translation algorithms, which allow interpreters to

quickly check their knowledge and improve their output (O'Brien, 2018). Furthermore, glossaries and terminology databases that are incorporated into CAI systems help interpreters find pertinent terms and stay consistent while interpreting (Hansen, 2016).

In numerous contexts, including conferences, diplomatic gatherings, and international events, simultaneous interpreting, or SI, is an essential means of facilitating communication across language barriers. To quickly and properly translate spoken content into the target language, interpreters have historically depended on their linguistic and cognitive skills (Gile, 1995). But the emergence of computer-assisted interpreting (CAI) systems has completely changed the SI environment. These systems give interpreters access to a variety of information and tools that are intended to improve their accuracy and efficiency (Doherty, 2019). Some scholars such as Chen et al. (2020) also argue that digital platforms are designed to simplifying sharing information. However, disagreements continue to exist about how technology affects interpreters' performance and the general caliber of interpreting. This paper investigates the development of SI in the context of technical breakthroughs, examining the advantages and difficulties presented by CAI systems.

2.Traditional Simultaneous Interpreting

Simultaneous interpretation (SI) is essential for international communication, diplomacy, and multilingual events. It is distinguished by interpreters who listen to speakers through headphones while working in soundproof booths and concurrently interpreting the speech into the target language. Interpreters must instantly understand, interpret, and pronounce speech, which requires a high level of cognitive work and strong concentration (Pöchhacker, 2016). Rapid source language comprehension, short-term memory retention, and clear speech production under time constraints are all aspects of the high cognitive load. Interpreters must rapidly and properly

comprehend the spoken word in order to provide rapid comprehension. This includes distinguishing idiomatic expressions, recognizing syntactic and semantic features, and highlighting important details and subtleties. For the purpose of accurately translating sentences, numbers, and important terms while processing fresh data, short-term memory retention is necessary. Furthermore, to produce well-spoken communication, one must be proficient in the target language and have the capacity to control intonation, tempo, and volume in order to align with the speaker's style and intent while maintaining clarity and fluency. Due to these challenges, interpreters usually work in pairs, switching between them to avoid getting tired and to keep a high standard of accuracy and coherence. They are able to maintain the caliber of interpretation during an event and efficiently manage the high cognitive load thanks to their collaborative approach (Flerov, 2013).

3.Review on the Historical Development of Technology-Assisted Interpreting

According to Sandrelli (2007, as referenced in Pöchhacker, 2015, p. 75), Computer Assisted interpretation Training (CAIT) is the process of using computer technology to improve interpretation training. Three phases comprise the history of CAIT: the early, middle, and present development periods. Digital speech banks, interpreting courseware, and computer-based teaching packages were all used in the early stages of interpreting training. Its benefit resides in the ease with which instructors lacking specialized training in software development can produce their own CAIT materials by incorporating a variety of resources—from textual to audio to video—into interpreting exercises, modules, and courses (Sandrelli, 2007; Sandrelli & Manuel Jerez, 2007, as cited in Pöchhacker, 2015, p. 75). During the middle period, online collaborative activities that promote user involvement and collaborative learning expand the conceivable applications of CAIT (Sandrelli, 2007, as cited in Pöchhacker, 2015, p. 76). According to Pöchhacker (2015), p. 75,

Sandrelli (2007) notes that in the current development phase, interpretation training outside of the classroom is not only made possible but also becomes more realistic and immersive in professional contexts. The development of machine translation was also examined by Zhang et al. (Zhang, Yang, Liu, & Li, 2018, pp. 93–94). Rule-based machine translation was the first, followed by statistics-based translation and finally neural-system-like machine translation.

4.Interpreting-related technologies

This technological move will primarily affect three areas: machine interpretation (MI), remote interpreting (RI), and computer-assisted interpreting (CAI). In order to improve quality and, to a lesser extent, productivity, computer-assisted interpreting is a type of oral translation in which a human interpreter uses computer software intended to support and facilitate some aspects of the interpreting task (Fantinuoli 2018a). Among other things, CAI technologies help interpreters create glossaries by integrating a variety of terminology resources, facilitating ergonomic term or entity searches, and extracting relevant information from preparation documents, to mention a few. Advanced aspects of the Natural Language Process, such automatic terminology extraction, identification of significant subjects, summarization, automatic speech recognition, and so on, are available to them. The primary motivation for the development of CAI tools is undoubtedly the desire to enhance the working conditions for interpreters. This is achieved by freeing them from labor-intensive duties (like creating and organizing terminology) and by assisting them with a variety of tasks, including retrieving preparatory documents and conducting professional-grade analysis on them. The ultimate goal of CAI tools is to raise the caliber of the interpreting performance by enhancing the working experience of interpreters, both before and during the act of interpreting. They are closely associated with and may have an impact on the

cognitive processes that underlie the primary tasks of interpreting, as they are an essential component of the interpreting process (one need only consider the most extreme scenario of retrieving terminological knowledge during simultaneous interpretation). The term "remote interpreting" refers to a broad category of interpreter-mediated communication that is provided through information and communication technology. It is not a static concept; rather, it can be applied to indicate various contexts and modes of operation. For instance, when all attendees of an event are assembled in one location and the interpreters are situated in a different location, or when an interpreter and one of the interlocutors are present at the same location. Technology-wise, there are a variety of ways to conduct conversations, ranging from basic phone calls to sophisticated videoconference apparatus(Fantinuoli 2018a).

For Fantinuoli(2017), until recently, the majority of uses for remote consecutive interpreting have been in the healthcare or legal sectors; conference interpreting is one area where RI has not been utilized very often. The complicated cognitive and communicative processes that underpin interpretation, as well as the limitations of the technologies now in use, are the reasons behind the limited adoption of RI. For example, tests on remote simultaneous interpreting (RSI) have brought to light a number of issues, including poor audio/video signal quality, contextual information being lost in part because of distance, and psychological factors like fatigue, increased stress, and lack of focus and motivation. Issues including turn-taking, isolation, and stress have been reported to be particularly prevalent in the field of dialogue interpreting, It has been discovered that some problems, like taking turns, estrangement, and stress, are very important. However, as technology advances, technical obstacles to remote interpreting are being removed, making it a feasible option for many stakeholders looking to reduce costs and improve service availability. Numerous governmental institutions have already adopted this technology as a result of

the growing need for liaison and sequential interpreting services, particularly for refugees. This might soon also apply to simultaneous interpreting situations. Empirical tests have demonstrated that, in certain situations, remote simultaneous interpretation can be carried out without violating the codes of professional associations, ISO standards, or other relevant norms applicable to interpretation (Causo 2011, p. 202). Consequently, there is a marked increase in the number of businesses offering RI platforms, both as interpreting hubs—that is, as professional settings with booths, top-notch consoles, technicians, etc.—and as home office solutions. But it's still unclear how widely it will be used.

According to Müller et al. (2016), machine interpreting (MI), sometimes known as speech-to-speech translation, automatic speech translation, or automatic interpreting, is a technological advancement that makes it possible to translate spoken language between languages using computer programmes. MI seeks to completely replace human interpreters, in contrast to remote interpreting (RI) and computer-assisted interpreting (CAI), which are intended to support or modify the work of human interpreters. In order to convert spoken language into written text, automatic speech recognition (ASR), machine translation (MT), and speech-to-text synthesis (STT) combine at least three essential technologies. STT creates an audio version of the text in the target language. Despite the fact that mi is still a long way from fulfilling the lofty goal of producing output of the same caliber as human translators, significant advancements have been made in recent years. This is because of the most recent advancements in a number of machine learning technologies. Deep neural machine translation has reached previously unheard-of levels of accuracy and fluency in the target language output, while artificial intelligence (AI) based on neural networks is now faster and more accurate than before. Following a significant amount of research in natural language processing, the initial MI prototypes have been revealed. As an example,

Müller et al. (2016) reported that the Karlsruhe Institute of Technology created a system for real-time automatic voice translation during university lectures. Furthermore, the market has seen the introduction of MI solutions by industry titans such as Microsoft with Skype Translator and Google with Pixel Buds.

The success of these systems has been quite modest so far as they fail to achieve the goal of quality and usability even for the most basic real scenarios in which interpreting is needed. The creation of machine interpreting systems is so challenging for several reasons, both at a technical and at a communicative level. On the technical side, quality of automatic translation and issues in the latency and flexibility of speech recognition as well as noise tolerance and speaker independence, to name but a few, exponentially increase the sources of errors and inaccuracies. On the communicative side, mi systems suffer from not being able to work – The ability of machine interpreting (MI) to comprehend non-verbal cues like the speaker's attitude and cultural allusions is one of the difficulties it currently faces. Nevertheless, machine learning is producing promising results in a number of related domains, such as sentiment analysis and attitude recognition, in addition to enhancing machine translation by addressing problems like lexical, syntactic, semantic, and anaphoric ambiguity. The incorporation of these developments into MI may improve its quality in the near future, making it more "intelligent" and maybe making its application possible in specific situations (Fantinuoli, 2017).

5. The Upcoming Technological Turn

Hughs (2016) states that the field of interpreting is clearly moving towards technology, mostly due to the growing ubiquity of interpreting-related solutions spurred by developments in information and communication technology and natural language processing. Moreover, these fields are evolving at a faster rate than in earlier times. Companies are actively allocating resources to the introduction of an increasing number of devices and

applications into the market in order to meet consumer needs and encourage additional innovation. The finding that interpretation is involved in significant and pervasive changes in the labour market brought about by technology advancements—specifically, automation and digitization—is more noteworthy. According to Hughs (2016) and Neufeind et al. (2018), these developments are changing how work is organized, and interpreting is no exception. Even though the translating industry has a negligible economic impact, there will probably be more pressure to adopt new technologies in the near future. The market is not the only factor pushing change in the industry; Besnier (2012) points out that society as a whole is also heavily reliant on technology and could have the power to force a paradigm shift in the industry, notwithstanding personal opinions and worries about how it will affect quality, working conditions, and other aspects. Although the use of technology is comparatively less of a barrier when it comes to CAI tools because its use largely impacts the micro-level processes of interpretation without having a major socio-economic impact, things get more complicated when one takes into account RI and MI.

It is difficult to forecast the true long- and medium-term effects of these two technologies. In terms of RI, it's clear that it will open up new employment opportunities in developing market segments, which will raise productivity—a rise in labour demand fueled by technical development. On the other hand, it's possible that it will result in worse working circumstances. New technologies related to interpreting, such as RI, could hasten the process of interpretation turning into a commodity, increasing the power of modern labour organization paradigms like outsourcing, which are already common in the language industry and many other tertiary professions. For example, it is possible that RI, especially in some market niches, will cause the service provider to become somewhat depersonalized. Customers have a propensity to choose the lowest choice as services become more impersonal and standardized, which can set off a downward

economic loop and ultimately cause the business to become less professional. In this kind of situation, machine interpretation could speed up this procedure even more. Even if MI is still in its infancy and existing implementations have obvious limits, the technology's quick development surely portends long-term effects on several parts of the industry As technology advances, interpreting professions may become more vulnerable. Furthermore, it might have a significant immediate impact on how the general public views the work done by qualified interpreters and, in turn, how different stakeholders see it. In certain cases, this might damage the reputation of the industry long before MI poses a real risk to human interpreters. Professionals have a generalized feeling of unease and scepticism when it comes to interpreting technologies, which is probably due to worries like the ones mentioned. This resistance usually takes the form of defence of the unique intellectual value of interpretation in the scenario of CAI or quality standards upholding in the case of RI. But at its core, opposition to technological change stems from an inherent sense of fear and uneasiness, which naturally leads one to view protecting the profession's interests as a justifiable and strategic objective (Pym, 2011).

As Fantinuoli, (2017, pp.376-377) sees, ironically, these negative tendencies might be avoided by carefully and wisely integrating interpretive technologies. From a wider angle, the best approach is to use technology to the interpreters' advantage, making the most of the advantages and opportunities that come with it while minimizing the dangers associated with falling behind the curve and the penalties that follow. It is undeniable that socio-technical changes are about to propel interpretation into a transformative era. Given this, it is imperative that the profession take a proactive part in this change. This calls for two important steps, at the very least. It requires, on the one hand, cultivating an open-minded attitude towards technology and the ability to rethink the field in light of new insights, empirical data,

and knowledge of how markets, society, and technology are evolving. Conversely, there is an urgent need for a coordinated research effort to predict future patterns so that the industry can prepare for the disruptive shifts brought about by digital technology. Though it is still a crucial part of the conversation, this study shouldn't only focus on the interpreter's point of view; it should also include the interests of other parties and include thoughts about socioeconomic metrics and other pertinent aspects.

It is essential to shed the light on CGPT translation, while researches on CGPT's translation capabilities remain limited, early findings such as those by Gao et al. (2023) suggest promising accuracy effectiveness in its outputs, despite identified challenges these studies highlight its potential as a viable tool for translation tasks.

It is important to highlight that there is a growing interest in technological themes, especially but not limited to RI, and that technology is being more and more integrated into interpretation training programmes, even though it is still rather peripheral within the field of Interpreting Studies. This is encouraging because it shows that people are becoming more conscious of how important technology improvements are to interpretation. This work might be considered a modest step in that direction because it provides new ideas, useful suggestions, and empirical facts that may help the interpreting community meet the next problems. The two technological innovations that are the subject of each chapter of the book—remote and computer-assisted interpreting—are anticipated to have a big influence on the day-to-day working conditions of interpreters in the near future (Fantinuoli, 2017).

6.Emergence of Computer-Assisted Interpreting Systems

To help interpreters, CAI systems have incorporated a number of technology capabilities, including real-time translation tools, speech recognition software, and terminology databases. Terminology databases enable quick access to specialized terms, which helps interpreters manage complex and domain-specific vocabulary more effectively (Fantinuoli, 2018). Speech recognition technology provides interpreters with a visual reference that reduces cognitive strain by transcribing spoken content in real-time. Furthermore, machine translation (MT) components are commonly included in CAI systems; these components produce preliminary translations that interpreters can then refine. Even while MT by itself is unable to achieve the sophisticated comprehension required for advanced interpreting, its incorporation into CAI systems offers a helpful framework, especially for routine content (Garcia, 2010).

7.Impact on Interpreter Performance and Quality of Interpretation

Performance of interpreters is greatly impacted by the use of CAI systems. By offering real-time assistance, these tools can lessen cognitive strain and free interpreters to concentrate on producing nuanced and contextually accurate interpretations (Mellinger, 2017). Improved productivity via instantaneous access to lexicon and real-time text assistance can lead to more reliable and superior interpretations. But relying too much on technology brings with it new difficulties. The limitations of real-time translation require interpreters to use these technologies skillfully, which can initially impede the flow and complicate the procedure (Fantinuoli, 2017). An over-reliance on technology may jeopardise long-term proficiency by causing a deterioration of key interpretive skills.

Another major challenge is quality assurance in interpretations made possible by CAI systems. While these instruments improve accuracy, they are not perfect. The interpreter must constantly verify and rectify the system's

contributions in order to prevent errors in speech recognition or machine translation outputs (Carlucci & Chiaro, 2019). This dual role can be demanding and could lower the overall quality of interpretation if not handled well. Thus it is difficult for interpreters to keep the source text meaning since each language has a linguistic system which is merely one component of a collection of interconnected systems that collectively constitute the spectacle (Bassnett 1991). Interpreting in general is a difficult task, interpreting certain expressions makes it even more difficult, for example interpreting idioms as Torsborg (1997: 109) stated that "the translation of idioms is as difficult as it is central" in other words, there are so many challenges that face interpreters that CAI systems can simplify it for them.

8.Future Prospects and Considerations

It is anticipated that simultaneous interpreting (SI) practices would greatly integrate computer-assisted interpreting (CAI) systems as they advance. The ongoing progress in natural language processing (NLP) and artificial intelligence (AI) holds great promise for making CAI tools more user-friendly, effective, and less obtrusive so they may be smoothly integrated into the interpreting process (Cao & Liu, 2014). These developments may be able to alleviate some of the existing drawbacks of CAI systems, including the cognitive strain associated with juggling several tools at once and machine translation errors.

9.Technological Advancements and Integration

Developments in NLP and AI may result in more complex speech recognition skills, which would enable CAI systems to handle a wider range of accents, dialects, and speech patterns. Improved speech recognition would lessen the cognitive load of continuously detecting and fixing mistakes by giving interpreters more accurate transcriptions (Cao & Liu, 2014). Furthermore, advances in machine translation algorithms may provide interpreters with faster, more accurate preliminary translations that are contextually correct and can be further refined.

Furthermore, context-aware recommendations and AI-driven predictive text may be included in future CAI systems, helping interpreters plan ahead and anticipate new content (Fantinuoli, 2018). These kinds of characteristics might be especially helpful in specialized or technical fields where exact wording is essential. By reducing mistakes and omissions, these intelligent solutions will not only assist the interpreter but also improve the overall quality of interpretation.

10.Training and Skill Development

Interpreter training programmes must change in order to accommodate the inclusion of sophisticated CAI systems within SI. While traditional interpreting abilities are still very important, interpreters also need to be proficient with these modern technology. According to Fantinuoli (2017), training programmes must to incorporate thorough modules that focus on the efficient utilization of CAI tools, highlighting their advantages as well as possible drawbacks. Interpreters need to learn how to use technology wisely while maintaining their innate abilities so as not to become unduly dependent on CAI systems. Technology literacy and ongoing professional development will be essential in this area. Training should also concentrate on creating techniques for smoothly alternating between technical support and human interpretation, allowing interpreters to continue performing at a high level even when technology is not available.

11.Ethical and Practical Considerations

Ethical questions about the usage of CAI systems also surface as they grow more common. material privacy concerns need to be addressed, particularly with regard to sensitive material that is frequently encountered in corporate or diplomatic situations. To preserve confidentiality and confidence, developers and users of CAI systems must make sure that these instruments adhere to strict data protection standards (Carlucci & Chiaro, 2019). Practically speaking, modern CAI systems' accessibility and cost may have an impact on how widely they are used. Large

international organizations may be willing to invest in these technology, while smaller organizations and independent translators may find the price too high. Thus, in order to guarantee that the advantages of CAI systems are broadly available, it is imperative to build solutions that are both affordable and scalable (ibid).

12.Methodology

This study uses a qualitative methodology to examines certain phrases in the context of technical innovation in simultaneous interpretation, and highlights the application of the Speech-to-Text (STT) system. The process entails choosing pertinent sentences that are representative of several domains, translating these phrases using the STT system, and assessing how well the translations handle language nuances and are accurate and coherent. The machine-generated translations are refined using human knowledge to ensure technical accuracy and terminological consistency. The investigation culminates in practical suggestions for enhancing the STT system's performance in simultaneous interpretation scenarios, including an evaluation of the machine translation output and documenting of findings. This study employs a qualitative, conceptual methodology. The analysis is founded on a comprehensive examination of scholarly literature, industry reports, and documented case studies. The texts were chosen to reflect varied viewpoints on the incorporation of technology in interpretation. The investigation entailed the identification of recurring themes, advantages, and apprehensions related to the employment of technology in simultaneous interpreting.

This research, being a conceptual study, does not entail the collecting of primary data. Rather, it consolidates insights from secondary sources like as peer-reviewed papers, interpretation training manuals, and professional association recommendations. This method facilitates an extensive comprehension of the subject without the necessity of empirical fieldwork.

13.Data Analysis

No.	Type of terminology	Source phrase		Translation
1	Legal	Due to process of law (Black, 1990)		إجراءات القانون النظامية
2	Scientific Jargon	Genetic mutation (Black, 1990)		تحليل التحوّرات الجينية
3	Diplomatic Terms	**A**	Bilateral trade negotiations (World Trade Organization, 2019)	مفاوضات التجارة الثنائية
		B	Peacekeeping mission deployment (United Nations Security Council, 2020)	نشر مهمة حفظ السلام
4	Financial Vocabulary	Monetary policy stimulus (Federal Reserve Bank of New York, 2020)		تحفيز السياسة النقدية
5	Medical Terminology	Vaccine efficacy assessment (Centers for Disease Control and Prevention, 2021)		تقييم فعالية اللقاح
6	Financial Vocabulary	Foreign direct investment inflow (International Monetary Fund, 2019)		تدفق الاستثمار الأجنبي المباشر
7	Public Health	Vaccine distribution strategy (World Health Organization, 2021)		استراتيجية توزيع اللقاح
٨	Technological Terms	Artificial intelligence applications (IEEE Computer Society, 2020)		تطبيقات الذكاء الاصطناعي
٩	Educational Terminology	Digital literacy curriculum" (International Society for Technology in Education, 2018)		منهج الثقافة الرقمية

Expression **No.1** "Due due process of law" refers, in legal contexts, to the equitable treatment and procedural rights that people are entitled to during judicial procedures. The translation preserves uniformity in legal terminology while faithfully capturing these ideas in Arabic.

The phrase **No.2** indicates the way genetic mutations are analyzed and studied in scientific research. The translation preserves clarity while faithfully capturing the technical nature of the original Arabic sentence.

As for expression **No.3/A** describes discussions between two nations with the goal of creating or amending trade agreements. The phrase's diplomatic and economic background is faithfully translated into the target language.

Furthermore, The deploying of military or civilian troops to areas of conflict in order to maintain peace and security is referred to in expression **No.3/B,** which was translated in an appropriate way for the context.

The meaning of the phrase **No.4** refers to actions done by central banks to use monetary policy to boost economic activity. The translation successfully delivers the intended concept while capturing the financial terms.

While phrase **No.5** describes the assessment of vaccinations' efficacy in averting illness. The translation effectively conveys the scientific background of the sentence while appropriately reflecting the medical vocabulary.

The meaning of expression **No.6** is the transfer of capital into a nation with the intention of starting a business or buying assets, the translator tended to use the literal strategy which gave the accurate meaning of the phrase.

In expression **No.7** The phrase describes the strategy or plan for giving vaccinations to the intended recipients, taking into account aspects like fair access, logistics, and prioritization.

A for expression **No.8** it describes programmes or devices that simulate human intellect to carry out operations like decision-making and problem-solving.

Finally the phrase **No.9** denotes a collection of instructional resources and exercises meant to foster the acquisition of digital technology proficiency.

14. Analysis and Discussions

It is critical to clarify the examination and debate of the translations given in the above examples:

The majority of the time, the interpretations show a high degree of success in maintaining the original meaning of the source phrases. Phrases such as "vaccine efficacy assessment" and "due process of law" are interpreted accurately into Arabic without losing any of their legal or medical value. This suggests that the translators had a thorough awareness of both the original language and its context.

Within their respective fields, the interpretations remain consistent in terms of terminology. For instance, proper technical vocabulary is rendered into Arabic when interpreting scientific phrases like "genetic mutation analysis" and financial ones like "monetary policy stimulus". This guarantees communication that is precise and clear, especially in specialized domains where terminology is important. The translations do a good job of capturing the cultural subtleties of certain expressions, even though there might not be exact interpretations for them in the target language. For example, the Arabic interpretations appropriately capture the diplomatic and economic meanings of phrases like "foreign direct investment inflow" and "peacekeeping mission deployment". This demonstrates the interpreters' proficiency in expressing cultural sensitivity in various settings.

Even though the interpretations were generally successful, there would probably be some difficulties along the way. These could consist of: Absence of Direct Equivalents: interpreters must discover appropriate substitutes while preserving the

original meaning when rendering phrases that may not have direct equivalents in the target language. The ever-evolving vocabulary around technology can make concepts like "artificial intelligence applications" and "digital literacy curriculum" difficult to understand. interpreters most likely overcame this difficulty by looking for domain-specific materials and taking the target audience's linguistic and cultural background into account.

It is imperative to ensure cultural sensitivity in interpreting, particularly when working with terms that carry particular cultural meanings. It's possible that interpreters struggled to faithfully capture these subtleties, especially in diplomatic or sociocultural settings. In order to assure correctness, they might have consulted native speakers or relied on their cultural understanding to handle this. Certain source phrases may contain intricate technical ideas that are difficult to render accurately and properly without losing the meaning. Interpreters most likely overcame this difficulty by gathering extensive information, speaking with subject matter specialists, and, when necessary, using specialized language.

15.Findings

The results of the study indicate that the efficiency of simultaneous interpreting has significantly increased thanks to computer-assisted interpreting (CAI) systems. Research has shown that interpreters who use CAI tools report spending less time preparing and providing interpretations during sessions more swiftly. Features like real-time transcribing and access to extensive glossaries, which enable interpreters to concentrate more on providing interpretations than on looking up terminology, are responsible for this boost in efficiency.

Additionally, CAI systems help to improve interpretation accuracy, especially when it comes to technical terms. Studies have indicated that interpreters utilizing CAI tools translate specialized terminology more accurately overall because they make fewer mistakes in doing so. Speech recognition software

and terminology management systems work together to reduce the cognitive load of interpreters during sessions so they may focus more on the actual interpretation process.

Professional interpreters' feedback usually shows that CAI systems are perceived favourably. Numerous interpreters are pleased with the assistance these products offer, especially when it comes to swiftly and effectively obtaining specialized terminology. Nonetheless, there are still issues with the efficient use and integration of CAI systems. To guarantee interpreters are able to take full advantage of new technology, extensive training programmes are required.

The analysis indicates that CAI technologies can improve translator precision and diminish preparation duration, especially in specialist domains like medical and law. Nonetheless, dependence on these technologies may elevate cognitive burden if not incorporated fluidly. Remote interpreting platforms provide flexibility and lower trip expenses, although they have issues including diminished audio-visual quality and interpreter isolation. The findings indicate that technology serves as a double-edged sword, presenting both potential and challenges that require management through focused training and ethical supervision.

CAI systems need to be customized to fit the unique needs of many fields, including finance, science, law, and diplomacy. In specialized sectors, this modification guarantees the relevance and accuracy of translations. Continuous research and development are necessary to improve CAI systems' usability and functionality. Potential future developments could involve enhancing machine translation skills and incorporating artificial intelligence for text prediction.

16.Recommendations

The following suggestions are for more study and advancements in translation techniques, particularly in specialized fields:

1. Domain-Specific Glossary Development: Make thorough glossaries for specialized fields including technology, education, research, economics, law, diplomacy, and medicine. Standardized translations of frequently used words and phrases should be included in these glossaries, together with explanations of their contextual meanings. Working together, linguists, subject matter experts, and translators can assist guarantee that terminology is accurate and consistent throughout translations.

2. Application of AI and Machine Translation Tools: Examine how translation workflows might be improved by using AI and machine translation technology, particularly for specialized fields. Create and enhance AI models that are especially trained on terminology unique to a given domain in order to increase translation efficiency and accuracy. Furthermore, use terminology management systems driven by AI to help translators keep translations coherent and consistent.

3. Crowdsourcing & Collaborative Translation Platforms: These translation tools allow you to leverage the combined knowledge of linguists, translators, and subject matter experts. Promote cooperation and information exchange among translators operating in specialized fields so they can share resources, best practices, and insights. The difficulties posed by different terminology and cultural quirks can be mitigated with the use of crowdsourced translation projects.

4.Interdisciplinary Research in Translation Studies: Foster interdisciplinary research collaborations between translation studies and other fields such as linguistics, cognitive science, computer science, and cultural studies. Investigate the cognitive processes involved in specialized translation, including how translators comprehend and render complex terminology across languages and cultures. Interdisciplinary approaches can yield valuable insights into translation strategies and methodologies.

5. Metrics for Specialized Translation Quality Assessment: Create uniform measurements and standards for judging the caliber of specialized translations. These criteria ought to consider things like readability, cultural sensitivity, terminological accuracy, and conformity to domain-specific standards. Provide standards and directives to enable uniform and impartial assessment of specialized translation results.
6. Professional Development and Training for Specialized Translators: Provide possibilities for professional growth and specialized training to translators operating in niche markets. Offer workshops, certification courses, and other materials aimed at improving the language proficiency, cultural competency, and domain expertise of translators. In order to stay up with developments in specialized sectors, promote continuous learning and skill development.
7. Moral Aspects to Be Taken Into Account in Expert Translation: Examine the special ethical issues and difficulties that arise in specialized translation, especially in delicate fields like law, medicine, and diplomacy. In specialized translation techniques, address concerns about confidentiality, correctness, objectivity, and cultural sensitivity. Provide best practices and rules to encourage moral behaviour in translators and guarantee that they are held accountable for their work.

17.Conclusion

The results of studies on computer-assisted interpreting (CAI) systems highlight how revolutionary they have the potential to be for simultaneous interpreting. These technologies improve overall performance by providing interpreters with increased accuracy, efficiency, and lower cognitive strain. However, in order to guarantee successful integration and use, achieving these benefits necessitates extensive training programmes and domain-specific modification.

Future studies and advancements in translation techniques can concentrate on a number of important areas. Domain-specific

glossaries, AI and machine translation tools, crowdsourcing and collaborative translation platforms, interdisciplinary research in translation studies, metrics for evaluating the quality of specialized translation, professional development and training for specialized translators, and ethical issues in specialized translation practices are a few examples of these.

Translation approaches can be improved to better satisfy the needs of specialized domains by tackling these research and development areas. This will guarantee accurate, culturally sensitive, and contextually relevant translations. This will make it easier for people to communicate effectively across linguistic and cultural barriers, giving people and organizations the confidence and accuracy to negotiate challenging linguistic environments. In the end, improvements in translation techniques will support better communication, cooperation, and understanding in a world society that is becoming more interconnected.

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