
# Translators and Artificial Intelligence: Ethical Reflections on Machine Translation

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**Mestrado em Tradução**

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# Resumo

A tradução automática, que teve nas patentes registadas por Georges Artsrouni e Petr Troyanskii nos anos 30 do século passado a primeira abordagem consistente, sofreu, até ao final do século XX, diversos avanços e recuos no seu desenvolvimento. Contudo, a partir da década de 90, com a intensificação do fenómeno da globalização e a massificação da internet, tornou-se uma realidade incontornável, apesar da ainda muito débil qualidade dos seus resultados. A sua crescente utilização aliada ao desenvolvimento exponencial das tecnologias de informação e comunicação, trouxe ao século XXI um nível de aperfeiçoamento da tradução automática que fez com que, hoje em dia, estes sistemas estejam facilmente acessíveis e sejam utilizados tanto pelo público em geral como por tradutores profissionais, quer no seu trabalho individual quer ao serviço de agências e fornecedores de serviços linguísticos.

Esta melhoria da qualidade dos sistemas de tradução automática teve um contributo importante dos modelos baseados em redes neuronais, os chamados modelos de *deep learning* (DL) ou *neural machine translation* (NMT). Ao invés dos modelos baseados em regras e dos modelos estatísticos, bastante utilizados até meados da segunda década do século XXI, os modelos de DL utilizam algoritmos de Inteligência Artificial (IA) com várias camadas de redes neuronais que tentam imitar a forma como o cérebro humano perceciona a realidade e que, depois de treinados com enormes quantidades de dados, são capazes de produzir resultados com uma fluência considerável, embora sempre sujeitos a um trabalho de pós-edição por forma a garantir a coerência e qualidade da tradução.

Tendo a evolução e generalização da utilização destes sistemas ocorrido a um ritmo consideravelmente acelerado desde meados da década passada até aos dias de hoje, esta rápida disseminação não facilitou a aquisição estruturada de conhecimentos sobre a forma como os sistemas funcionam e sobre as implicações éticas envolvidas na sua utilização por parte dos intervenientes no processo e, em particular, por parte dos tradutores profissionais. Foi a tomada de consciência desta lacuna, sentida no meu trabalho enquanto tradutora e percecionada relativamente aos colegas que me rodeiam, que desencadeou a vontade de realizar este trabalho.

Numa primeira fase, foi identificado o problema: a falta de informação sobre a forma como os tradutores utilizam os sistemas de tradução automática e sobre a sua perceção relativamente aos desafios éticos dessa utilização. De seguida, foi definida a forma como se procederia à investigação do problema identificado, tendo-se concluído que o

inquérito seria a ferramenta mais adequada para auscultar a opinião dos tradutores relativamente às diversas vertentes do problema, considerando a relativa facilidade de acesso a ferramentas para a sua elaboração, bem como uma considerável agilidade, quer na respetiva disseminação junto desta classe profissional, quer na recolha e análise dos dados.

Nesta fase do trabalho, foi de extrema importância e utilidade a colaboração com uma colega da Universidade de Tampere, na Finlândia que, dada a relevância do tema, iniciou a elaboração de uma dissertação paralela a esta, utilizando o mesmo método de investigação. Deste modo, houve um trabalho conjunto em diversas etapas do processo. Em primeiro lugar, definiram-se as questões a que o inquérito deveria responder:

- Até que ponto estão os tradutores familiarizados com os sistemas de tradução automática?
- Qual o impacto dos sistemas de tradução automática na atividade profissional dos tradutores?
- Em que medida estão os tradutores conscientes das implicações éticas dos sistemas de tradução automática.

Seguidamente definiu-se o público-alvo:

- Todos os tradutores profissionais, independentemente da área de especialização, desde que as suas línguas de trabalho incluam o português europeu e/ou o finlandês.

Finalmente, elaborou-se o inquérito, inicialmente em língua inglesa, que depois de testado por tradutores profissionais experientes e ajustado em função do resultado desses testes, foi traduzido para português e finlandês e enviado ao respetivo público-alvo nos dois países. Em resultado deste envio, no qual contámos com o apoio da Associação Portuguesa de Tradutores (APT) e da Associação Finlandesa de Tradutores e Intérpretes (SKTL), foram recolhidas um total de 85 respostas (32 ao inquérito em língua portuguesa e 53 ao inquérito em língua finlandesa).

Na presente dissertação são apresentadas e analisadas as respostas obtidas e feita uma breve comparação entre os resultados do inquérito realizado em língua portuguesa e os resultados do inquérito realizado em língua finlandesa. Para esse efeito, a dissertação está organizada em cinco capítulos com a seguinte estrutura:

*Primeiro capítulo – Introdução*

Neste capítulo é introduzido o tema, a metodologia e os objetivos do trabalho.

*Segundo capítulo - Enquadramento*

Aqui é apresentada uma breve definição do termo "Ética" e é também feito um enquadramento teórico da IA, dos seus impactos positivos e negativos e das questões éticas que giram em torno desta tecnologia. Para tal, são referidos conceitos como o de *Responsible Artificial Intelligence (AI)* ou *Trustworthy AI* na aceção dada por organismos internacionais, como a Organização para a Cooperação e Desenvolvimento Económico (OCDE), a Comissão Europeia ou as Nações Unidas, e é apresentado o *AI Act (AIA)*, a primeira legislação que pretende regular a utilização da IA na União Europeia. É ainda apresentado um breve resumo histórico sobre a evolução dos sistemas de tradução automática, com recurso a Hutchins (2014) e são referidas as principais implicações éticas que surgem das diferentes vertentes de utilização destes sistemas, fazendo desde logo a ponte com a abordagem que estas implicações merecem no inquérito realizado junto dos tradutores profissionais. Para finalizar o segundo capítulo, apresentam-se três inquéritos realizados recentemente junto desta classe profissional que expõem diferentes perspetivas de abordagem do tema, nomeadamente, as razões para a adoção ou não dos sistemas de tradução automática por parte dos tradutores (Cadwell *et al.*, 2017), a opinião dos tradutores sobre a pós-edição, os seus medos, anseios e preferências (Pérez Macías, 2020) e o modo como os tradutores utilizam estes sistemas (Farrell, 2022). De salientar que nenhum desses estudos foca as questões éticas, pelo que, mais uma vez, se confirma a relevância da abordagem feita pela presente dissertação.

*Terceiro capítulo – Metodologia*

No terceiro capítulo é feita uma descrição pormenorizada da metodologia utilizada para a realização do inquérito, tanto no que diz respeito ao modo como o questionário foi construído e testado, como em relação à forma como foram recolhidas e analisadas as respostas dos tradutores.

*Quarto capítulo - Resultados*

No quarto capítulo são apresentadas as perguntas incluídas no inquérito bem como analisadas as respostas a cada uma dessas perguntas. O capítulo divide-se em duas secções sendo a primeira aquela em que se analisam os resultados do inquérito em língua portuguesa, focando-se a segunda numa análise comparativa entre esse inquérito e o realizado em língua finlandesa. Em ambas as secções, os resultados são

apresentados de acordo com a seguinte estrutura: (1) Perfil dos tradutores; (2) Conhecimento e utilização de sistemas de tradução automática; (3) Impacto da tradução automática no trabalho dos tradutores; (4) Questões éticas; (5) ChatGPT.

*Quinto capítulo - Conclusões*

Finalmente, no último capítulo, apresentam-se as conclusões deste trabalho, referem-se algumas das limitações encontradas e propõem-se algumas ações futuras. Essas ações visam o aprofundamento da investigação agora iniciada e sugerem algumas linhas orientadoras para uma melhor utilização desta ferramenta tecnológica e para a valorização do papel dos tradutores.

Das conclusões apresentadas, destacam-se os seguintes pontos: (1) os tradutores profissionais adotaram e integraram os sistemas de tradução automática no seu trabalho; (2) a generalidade do conhecimento adquirido nesta área teve origem em autoaprendizagem; (3) os tradutores reconhecem que estes sistemas são uma ferramenta incontornável, mas usam-nos com alguma apreensão e incerteza relativamente às implicações futuras; (4) a maioria dos tradutores considera os sistemas de tradução automática uma ameaça; (5) apenas uma minoria reconhece existirem benefícios e potencial na utilização desta tecnologia; (6) as preocupações éticas mais referidas, nas opções de escolha múltipla do inquérito, relacionam-se com o enviesamento dos resultados, a autoria, tanto dos dados de treino, como dos resultados da tradução automática, e o papel e estatuto dos tradutores; (7) outras preocupações expressas nas perguntas abertas são, por exemplo, a importância da literacia em sistemas de tradução automática, os riscos de desinformação, a possibilidade de substituição dos humanos por máquinas, ou o declínio das suas capacidades cognitivas; (8) existe uma carência de linhas orientadoras que guiem os tradutores durante este processo de mudança e adaptação.

Em face destas conclusões, são propostas algumas ações futuras, nomeadamente: (1) incentivar um esforço conjunto para promover a literacia sobre tradução automática e IA entre os tradutores profissionais e os estudantes de tradução; (2) motivar as associações de tradução para a inclusão de orientações nos seus códigos de conduta relativamente a uma utilização ética dos sistemas de tradução automática, valorizando o papel dos tradutores e o estatuto da profissão; (3) implementar cursos de formação certificados que permitam aos tradutores apresentarem-se como profissionais certificados em sistemas de tradução automática, contribuindo para a melhoria da pós-edição dos resultados de tradução automática e para a promoção do estatuto dos tradutores enquanto profissionais-chave neste ecossistema; (4) aprofundar a

comparação entre os inquéritos português e finlandês; (5) alargar a aplicação do presente inquérito a outros países; (6) realizar um inquérito periódico para monitorizar o nível de sensibilização, aceitação e conhecimento dos sistemas de tradução automática por parte dos tradutores.

Palavras-chave: Tradutores Profissionais, Inteligência Artificial, Ética, Tradução Automática

# Abstract

Despite the widespread adoption and accelerated evolution of Machine Translation (MT) systems since the middle of the 2010s, there has not been enough structured learning about how they function or the ethical issues surrounding their use, especially among professional translators.

This dissertation presents responses gathered from a survey conducted among professional translators, aiming to address the following questions: (1) to what extent are translators familiar with MT; (2) what are the perceived implications of MT on the translators' professional activities; (3) how aware are translators of MT ethical implications? This research was done in collaboration with a colleague from Tampere University, who conducted the same survey with translation professionals in Finland. It received support for distribution from both the Portuguese and the Finnish translators' associations.

The main conclusions are: (1) MT was extensively adopted by translators and integrated into their workflow; (2) most of the knowledge about MT systems was self-acquired; (3) translators acknowledged MT systems as unavoidable tools but used them with apprehension about future implications; (4) the majority perceived MT systems as a threat and held negative sentiments towards them; (5) a minority recognised their benefits and potential; (6) the most frequently chosen ethical concerns were bias, authorship and translators' role and status; (7) other concerns were the importance of MT literacy, apprehensions about potential disinformation risks, the replacement of humans by machines and the decline in cognitive human abilities; (8) there was a lack of guidelines to assist translators in navigating this process of change.

Several future actions are proposed, namely: (1) to stimulate a combined effort to boost MT and AI literacy among translators, both professional and students, and to recognise their role and status; (2) to prompt translators' associations to include guidelines in their codes of conduct for an ethical utilisation of MT systems; (3) to implement training courses that certify translators as MT systems specialists, enhancing the quality of MT post-edited translations and the status of the translators; (4) to further delve into the comparison between the Finnish and Portuguese surveys; (5) to expand the present survey by gathering responses from additional countries; (6) to set a follow-up survey to periodically monitor the level of acceptance and knowledge of MT systems.



Keywords: Professional Translators, Artificial Intelligence, Ethics, Machine Translation.

# Acknowledgments

Deciding to return to university and finally complete my master's degree, 30 years after finishing my bachelor's, was an easy choice. It was something I had always wanted to do but never had the time for. Now that my professional life was slowing down, it felt like the right time to pursue it.

Luck also played a significant role. I was fortunate to have Helena Moniz, FLUL's Assistant Professor and President of the European Association for Machine Translation (EAMT), as a teacher in one of my academic seminars. Her enthusiasm for the subject of MT and its importance in our profession today was contagious. She encouraged me to explore the theme of ethics in MT in a small paper we had to produce as a final assignment at the end of the second semester and this served as the seed for my thesis topic.

Taking the next step was a natural progression, although I was not entirely certain of success. I approached Helena to be my supervisor, and she accepted with great enthusiasm, which was a true honour to me. After our initial meetings, in the beginning of the second year, she introduced me to Mary Nurminen, PhD from Tampere University, and suggested Mary as a co-supervisor due to the overlap in some of our research interests and Mary's expertise on the theme. It was also an honour that Mary accepted the invitation almost immediately. Therefore, I want to express my deepest gratitude to you both, for your constant availability to hear me, despite your busy schedules, and for all your support, encouragement, wise teachings and advice, enthusiasm, and nitpicking (this one is especially for you, Mary 😊). I consider myself incredibly lucky to have met you both and cannot thank you enough for all you have done to help me achieve this goal!

I must also thank my colleague at Tampere University, Annika Mattila, who joined me in working on a similar thesis for her master's degree after our initial meeting. Thank you for your insightful contributions and for enriching my work. I wish you all the best for your thesis and future endeavours. I sincerely hope and believe that we will continue to collaborate further!

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The support from the Portuguese Translators Association (APT), which published the survey on its social media channels, was invaluable in reaching more colleagues willing to participate. Thank you so much for your assistance!

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# List of abbreviations and acronyms

| Abbreviation | Description |
|---|---|
| AI | Artificial Intelligence |
| AIA | AI Act |
| ANN | Artificial Neural Networks |
| APT | Portuguese Association of Translators |
| ATA | American Translators Association |
| AVT | Audiovisual Translation |
| BERT | Bidirectional Encoder Representations from Transformers |
| CAT | Computer Assisted Translation |
| CDSS | Clinical Decision Support System |
| CEDRO | Centro Español de Derechos Reprográficos |
| DGT | Directorate-General for Translation |
| DL | Deep Learning |
| EAMT | European Association for Machine Translation |
| EU | European Union |
| FLUL | Faculdade de Letras da Universidade de Lisboa |
| GDPR | General Data Protection Regulation |
| GNMT | Google Neural Machine Translation |
| GPS | Global Positioning System |
| GPT | Generative Pre-trained Transformer |
| GPU | Graphics Processing Units |
| IA | Inteligência Artificial |
| IAPTI | International Association of Professional Translators and Interpreters |
| ITI | Institute of Translation and Interpreting |
| LLM | Large Language Model |
| LM | Language Model |
| LSP | Language Service Provider |
| MEP | Member of the European Parliament |
| ML | Machine Learning |
| MT | Machine Translation |
| MTPE | Machine Translation Post-Editing |
| NMT | Neural Machine Translation |
| OECD | Organisation for Economic Co-operation and Development |
| OJEU | Official Journal of the European Union |

| Abbreviation | Description |
|---|---|
| PE | Post-Editing |
| RBMT | Rule-Based Machine Translation |
| SDG | Sustainable Development Goals |
| SKTL | Finnish Association of Translators and Interpreters |
| SMT | Statistical Machine Translation |
| SPA | Sociedade Portuguesa de Autores |
| T&I | Translation and Interpreting |
| UK | United Kingdom |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| US | United States |

# Disclaimer

As the author of this master's thesis, I want to state that I wrote it entirely in English, starting from scratch. To enhance the quality of the English language used, I employed the assistance of OpenAI's ChatGPT, a generative AI model. It is important to note that the model was solely utilised for the purpose of refining the language and did not contribute with any content to the thesis. Therefore, all the content within the thesis is entirely original and authored by me.

# 1. Introduction

When I first considered returning to university more than 30 years after completing my bachelor's degree, three main factors motivated me:

- I had some spare time, having slowed down my professional career of three decades, especially after the last 10 years that had been tremendously challenging and absorbing.
- I finally had the opportunity to pursue my master's degree, something I had always wanted to do.
- I felt that the translation industry and the work of professional translators had undergone immense changes in recent years due to the avalanche of technology that had been put to the service of the profession. I did not quite know how to use this technology, not only because I had little technological expertise, but also because of all the ethical implications it posed.

Interestingly, when I returned to the university, I found that my concerns about how technology was changing the profession and how translators should deal with it in an ethical way were not mine alone. Several of my colleagues, regardless of their age and years of experience in the profession, shared these concerns. Therefore, choosing to develop my study and thesis about MT, AI, and the ethical questions surrounding these technologies was nothing less than a natural choice. Given the novelty and relevance of the theme and the eagerness of all stakeholders for valid research in this area, the work would only make sense to me if it would be focused on research. These were the reasons why I decided to move forward with this theme and research methodology, that ultimately consisted of a survey directed at professional translators and its subsequent analysis.

Fortunately, with the guidance and support of my supervisors, Dr. Helena Moniz and Dr. Mary Nurminen, I successfully connected with a fellow student at Tampere University who shared an interest in the same research theme. This colleague has since initiated work on a mirroring thesis, creating a collaborative effort in exploring this area of study. With the right team assembled, I began to define the goals and structure the work, and I arrived at the following outline.

## 1.1 The problem

AI and MT are transforming the way the translation process develops in all areas of expertise. The ability to translate a source text into a target language in seconds is now

accessible to any individual who has a computer and an internet connection. In recent years, significant investment has been made, corresponding not only to an enormous technological advance, but also to an increasing democratisation in access to these systems, which are continuously being improved. MT results are used in an increasing number of domains and everyday situations, both by the general public, as a way to quickly read texts written in foreign languages, and by professional translators, who find in this technology a way to speed up work and pre-translate texts that will then be post-edited. In a report published by the Organisation for Economic Co-operation and Development (OECD) about the implications of MT technologies for language professionals and for broader society, Borgonovi *et al.* (2023, p. 8) talk about the significant transformation occurred in the area of MT, caused by the advances in natural language processing. The authors cite a report by Intento (2022), titled *The State of Machine Translation 2022*, which indicates that the number of unique translatable language pairs increased from around 16 000 in 2019 to around 150 000 in 2022 . The authors also refer the high level of accuracy that can be achieved by MT technologies, although they point out that the accuracy and the quality of translations may vary depending on factors like the complexity of the text to be translated, as well as the algorithms being used by the Large Language Models (LLM) and the quality, quantity and variety of the translations that are used to train those algorithms. Consequently, the work of professional translators is rapidly evolving, whether they employ MT for professional purposes, or their clients utilise this technology. The widespread use of these systems raises ethical issues affecting all the stakeholders in the process, from the companies and engineers who build the systems, to the general public, who consume the outputs of MT and to translators who use or see their work in some way impacted by these systems. However, this changing landscape has not necessarily been accompanied by an awareness or guidance regarding the ethical implications associated with the use of these systems.

## 1.2 The methodology

Amidst the ongoing discussions about the use of generative AI models, such as ChatGPT, as automatic translators, I decided to use a survey to collect data from professional translators on their usage of MT systems and on their awareness about the ethical challenges that are posed by the use of these systems. Having my fellow colleague from Tampere University on board, our goal was to include translators from various areas of work, as long as their working languages included European Portuguese and/or Finnish.

The choice to use a survey in my research is based on two main factors. First, the constant evolution in the field of MT is notable. Surveys serve as convenient and cost-effective instruments, making them perfect for capturing the current attitudes of translators towards technology. Moreover, they can be employed periodically to track changes, considering the rapid evolution of technology and the fluid nature of translators' behaviours over time. Second, there's a noticeable lack of information concerning the awareness of translators regarding ethical issues associated with technology. Surveys, being accessible and relatively inexpensive, offer an excellent means to directly gather opinions and insights on the extent of translators' awareness and knowledge regarding these ethical concerns.

With these aspects in mind, I opted for a set of questions to gain insights into how translators currently use this technology and address its ethical considerations. This approach allowed me to obtain an up-to-date perspective on the current behaviour and thoughts of professional translators and served as a tool for analysing the trajectory of user practices in this domain.

## 1.3 The objectives

In order to start working on this thesis, I laid out the three key objectives I aimed to accomplish by the end of my research:

- To gain insight into the extent of the Portuguese translators' familiarity with MT systems and of their awareness about the ethical issues this technology encompasses.
- To comparatively analyse MT usage and awareness of ethical issues among Portuguese and Finnish professionals (hence the mirroring thesis being conducted at Tampere University).
- To contribute to the field by proposing further studies and guidelines, based on the analysis of the results, that enhance translators’ awareness of the ethical challenges posed by MT systems.

In the forthcoming chapter, titled "Background", I commence by providing a definition of ethics. This serves as the foundational framework for my exploration of the use of MT by professional translators. Subsequently, I delve into the evolution of AI and discuss global initiatives aimed at ensuring an ethical and responsible deployment of this technology. This discussion then transitions to an overview of MT and its developmental trajectory, incorporating an examination of key ethical considerations in the realm of MT usage,

drawing on perspectives from experts in the field. The chapter culminates with insights from three recent studies that shed light on how translators currently leverage this technology.

The subsequent chapter, designated as “Methods”, concentrates on exposing the methodology employed in crafting and launching the survey, as well as in analysing its results. It describes in detail all the steps taken, since the idea came up until the Portuguese results were analysed, discussed and compared with the Finnish ones.

Moving on to the fourth chapter, "Results", it is divided into two main sections. In the first one I present, analyse and discuss the findings from the Portuguese survey. In the second one I undertake a brief comparative analysis, juxtaposing these results with those gleaned from the Finnish survey.

Finally, the concluding chapter, “Conclusions”, distils the essential insights gathered from the survey results. Additionally, it proposes next steps regarding further research in this area and guidelines for promoting the ethical use of MT systems among professional translators and for valuing their role and status in this ecosystem, thereby providing a comprehensive wrap-up to this research project.

# 2. Background

## 2.1 Ethics

In the preceding chapter, I highlighted a significant motivator for undertaking this research and thesis. Namely, I found myself feeling considerably outdated concerning the technological landscape within the professional realm of translation. The rapid advancements in technology in this field raised ethical questions that left me grappling with uncertainty.

Consequently, my initial focus centres on delving into the essence of the term "Ethics" and elucidating why it holds paramount importance within the translation profession. I aim to explore the foundational principles that underpin ethical considerations, shedding light on their crucial role in guiding translators through the intricate terrain of technology in their field.

In a first attempt to define the term, I come across an entry at Britannica.com which seems quite straightforward:

> The term ethics may refer to the philosophical study of the concepts of moral **right and wrong** and moral **good and bad**, to any philosophical theory of what is morally right and wrong or morally good and bad, and to any system or **code of moral rules, principles, or values**. The last may be associated with particular religions, cultures, **professions**, or virtually any other group that is at least partly **characterised by its moral outlook**. (Singer, 2024) [bold type added].

The practice of translation is intricately intertwined with this definition. It is governed by a code of moral values that regulates the profession, underpinned by a profound sense of responsibility, encapsulating the notions of right and wrong, as well as good and bad. As referred by Reijers & Dupont (2023, p. 4), translation involves sacrifice in the sense that there is an inevitable loss or lack in the act of translating a text from its source language to a target language. Consequently, the translator bears the responsibility of managing an unavoidable treason. On the other hand, the same authors also contend that translation serves as a conduit for establishing common ground amidst foreign and heterogeneous elements, harmonising the source and target languages, along with the myriad cultural facets and diverse worldviews they encompass. In essence, it acts as a

bridge, facilitating peaceful coexistence. Furthermore, they also talk about the significance of upholding standards of excellence and virtuous attributes like honesty and fidelity, which function as a counterbalance to the act of betrayal which is inherent to the act of translation.

To underscore this point, a brief examination of prominent professional translation associations' websites worldwide reveals a consistent presence of a code of ethics, intended to guide their members' professional behaviour. These codes exhibit commonalities closely aligned with the assertions of Reijers & Dupont (2023):

> (…) Carry out translating or interpreting tasks **thoroughly and responsibly**. (…) Only accept jobs for which they are able to guarantee a proper **standard of quality** to their clients. (…) Respect **confidentiality** with regard to any and all materials received from their clients (…). (IAPTI, 2023) [bold type added].

> (…) to conduct ourselves in a professional manner with **honesty and integrity** in our interactions with clients, colleagues, and the general public (…); to honestly represent and work within our qualifications, competencies, capabilities, and responsibilities; (…) to **hold in confidence**, not divulge, and **protect privileged and/or confidential information** obtained in the course of our work; to convey meaning between people, organisations, and cultures **accurately, appropriately, and without bias**, depending on the context of the source, purpose, readership or audience, and medium (…). (ATA, 2023) [bold type added].

> Members are required to act in accordance with [the principles of] (…) **Honesty and integrity**; (…) **Professional competence**; (…) Client **confidentiality and trust**; (…). (ITI, 2023) [bold type added].

> (…) The translator should be considered a server of the language and culture and, as such, prove worthy of the inherent responsibilities. (…) The translator has the duty to make an **accurate and faithful translation** of the original content, keeping **impartiality and neutrality** in all circumstances. (…) The translator is obliged to

> maintain **full and absolute confidentiality** in regard to any kind of work done. (…) The translator is committed to **not incurring any unethical practice** in the performance of his/her duties. (…). (APT, 2023) [bold type added].

In these codes of ethics, echoing the words expressed by Reijers & Dupont (2023), we find recurring concepts closely associated with the act of translation. These encompass moral values like responsibility, sacrifice, treason, respect for cultural differences, standards of excellence, honesty, fidelity, competence, trust, confidentiality, integrity, accuracy, impartiality and neutrality, just to name a few. It is evident that these terms and concepts typically do not align with the operational characteristics of machines. Machines are commonly associated with repetitive tasks devoid of cognitive decision-making in ostensibly similar scenarios, which do not consider subjective values influenced by moral and ethical paradigms when executing a given task. Consequently, the conundrum arises: how can a machine undertake a task as inherently subjective and multifaceted as translation? Translation, as previously discussed, involves unpredictable variables and holds paramount importance for conveying messages accurately. What ethical considerations underlie the utilisation of machines for this sensitive and subjective task? Which ethical dimensions warrant the most attention due to the potential impact of machines on the translation process? These pressing questions demand the attention of all stakeholders within the translation industry. It is imperative to address them to safeguard the preservation of translation quality standards and, ultimately, to prevent the loss or distortion of meaning in the final message.

Prior to delving into specific ethical aspects requiring attention within the context of MT, which are subject to analysis later on in the present Chapter and also in Chapter 4, based on survey outcomes, I initially set the stage by providing a concise overview of AI, since this technology forms the foundation for the main MT systems in use. Subsequently, I discuss MT, tracing its historical evolution and outlining the primary types of systems currently utilised.

## 2.2 Artificial Intelligence

### 2.2.1 Definition of Artificial Intelligence

According to the definition provided by the OECD, which has also been adopted by the European Parliament in the context of the European Union (EU) AIA,

> (…) an AI system is a machine-based system that is capable of influencing the Environment by making recommendations, predictions or decisions for a given set of Objectives. It does so by utilising machine and/or human-based inputs/data to: i) perceive real and/or virtual environments; ii) abstract such perceptions into models manually or automatically; and iii) use Model Interpretations to formulate options for outcomes. (OECD, 2019)

Nowadays, apart from all the hype around ChatGPT and similar generative AI models, AI technology and systems are ubiquitous, permeating various aspects of our lives in ways that are often underappreciated. Examples range from simple tasks like unlocking our smartphones using facial recognition or benefiting from keyboard autocorrection when composing messages, to receiving personalised movie recommendations from streaming services. These everyday instances highlight the pervasive presence of AI. Moreover, AI is extensively employed in a wide array of complex domains, including aerospace engineering, biotechnology, energy management, finance and cybersecurity. It is also worth mentioning, although it will be handled in greater depth later in this thesis, that, as Nurminen & Koponen (2020) point out, MT as an instance integrating AI technology into its systems, has been used to increase the access to information, especially for groups that are underserved, namely minority languages and immigrant populations. It was also one of the first stand-alone AI applications to be accessed by the general public.

In a report titled *The art of AI maturity - Advancing from practice to performance*, Vohra *et al.* (2022) indicate that in less than 70 years, AI has transformed from a scientific idea to a permanent fixture in society. By 2021, executives of the world's 2 000 largest companies (based on market capitalisation) who mentioned AI during their earnings calls were 40% more likely to experience an increase in their firms' share prices. This was a significant rise from 23% in 2018.

However, beyond the remarkable potential and convenience that this world offers to corporations and individuals alike, it is crucial to assess the genuine benefits and risks associated with AI. Can it truly contribute to the sustainable development of humanity, as defined by the United Nations (UN) in the 2030 Agenda for Sustainable Development[1]? Or do the risks associated with its development outweigh the potential benefits it may bring? In order to answer these questions, there is the need to understand how AI works.

### 2.2.2 Machine Learning and Deep Learning

Since the advent of the initial digital computers in the 1940s, it became evident that these machines possessed the potential to be programmed for undertaking intricate tasks, such as playing chess or solving complex mathematical theorems. Subsequently, there has been a remarkable evolution in the field of AI, with research efforts dedicated to understanding and replicating various facets of human intelligence, including generating language. Notably, this pursuit has given rise to transformative concepts and technologies, prominently Machine Learning (ML) and Deep Learning (DL).

ML can be defined as

> the ability to learn without being explicitly programmed. (…) [It] enables Artificial Intelligence (…) by implementing an algorithm that trains a machine on how to learn by itself so that it can adapt to upcoming changes without human intervention. This training is accomplished by feeding large amounts of relevant data, allowing the algorithm to adjust itself and improve. (Prasad & Choudhary, 2021, p. 6)

DL, on the other hand, represents a subset of ML that can be viewed as its evolutionary progression. It aims to mimic the human brain's approach to data analysis by utilising complex structures of artificial neural networks (ANN). These networks consist of multiple layers that can independently learn and make decisions. Figure 1 below is a diagram that illustrates a deep neural network.

[1] "(…) [T]he 17 Sustainable Development Goals (SDGs) (…) recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests." (United Nations, n.d.)

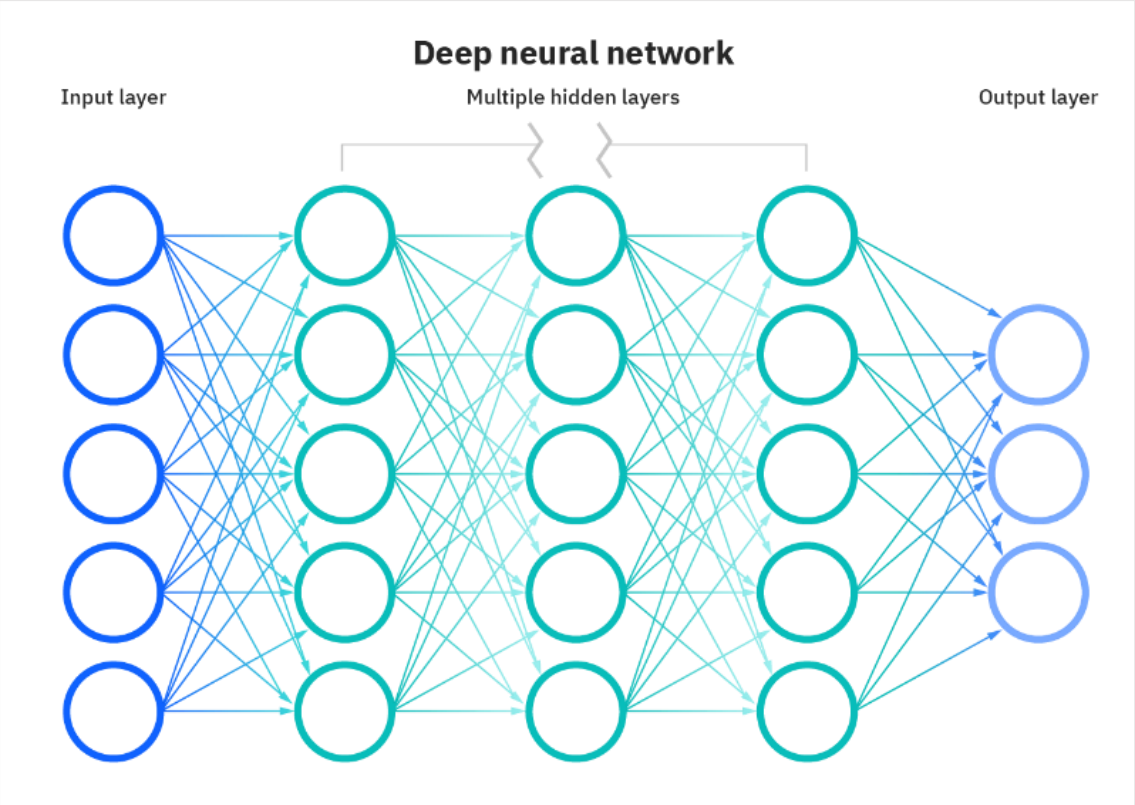



*Figure 1 - Deep learning neural network diagram*
*Source: IBM (https://www.ibm.com/cloud/blog/ai-vs-machine-learning-vs-deep-learning-vs-neural-networks)*

This evolution has allowed for AI, as a whole, to become an undeniable and increasingly present reality in our daily lives. As indicated by the aforementioned Accenture report, its prevalence is projected to, "(…) increase rapidly and significantly, more than doubling from the current 12% to 27% by 2024."[2] (Vohra *et al.*, 2022)

### 2.2.3 Generative Artificial Intelligence

AI has been utilised by a significant portion of the population in a more or less conscious manner, given its integration into various applications as their technological foundation. This trend has persisted for several years. However, the democratisation and public awareness of AI experienced a significant breakthrough with the introduction of ChatGPT at the end of 2022. This release propelled AI into the limelight and made it accessible to the general public, thereby presenting boundless possibilities for application and utilisation.

[2] These percentages refer to what the report defines as AI Achievers, i.e., the "(…) firms [that] have advanced their AI maturity enough to achieve superior growth and business transformation, according to Accenture's extensive analysis of approximately 1 200 companies globally." (Vohra *et al.*, 2022)

ChatGPT, developed by OpenAI, is an example of a generative AI conversational model that possesses the capability to swiftly generate new content based on user inputs. These inputs, referred to as prompts, comprise written instructions that prompt the application to generate diverse forms of content such as reports, computer programs, fairy tales, essays, poems, translations, or text summaries, just to name a few, depending on the user's instructions. ChatGPT is founded on OpenAI's underlying Generative Pre-trained Transformer (GPT) models and has undergone fine-tuning for conversational purposes using a combination of supervised and reinforcement learning techniques. In addition to ChatGPT, OpenAI has also introduced Dall-E, a deep learning model specifically designed to generate images based on text prompts (OpenAI, n.d.).

Although other players in the market have also launched similar generative AI models, like Google with Gemini (formerly Bard) or Meta with Llama, no other has yet reached ChatGPT's significance, which can be gauged by its rapid global adoption.

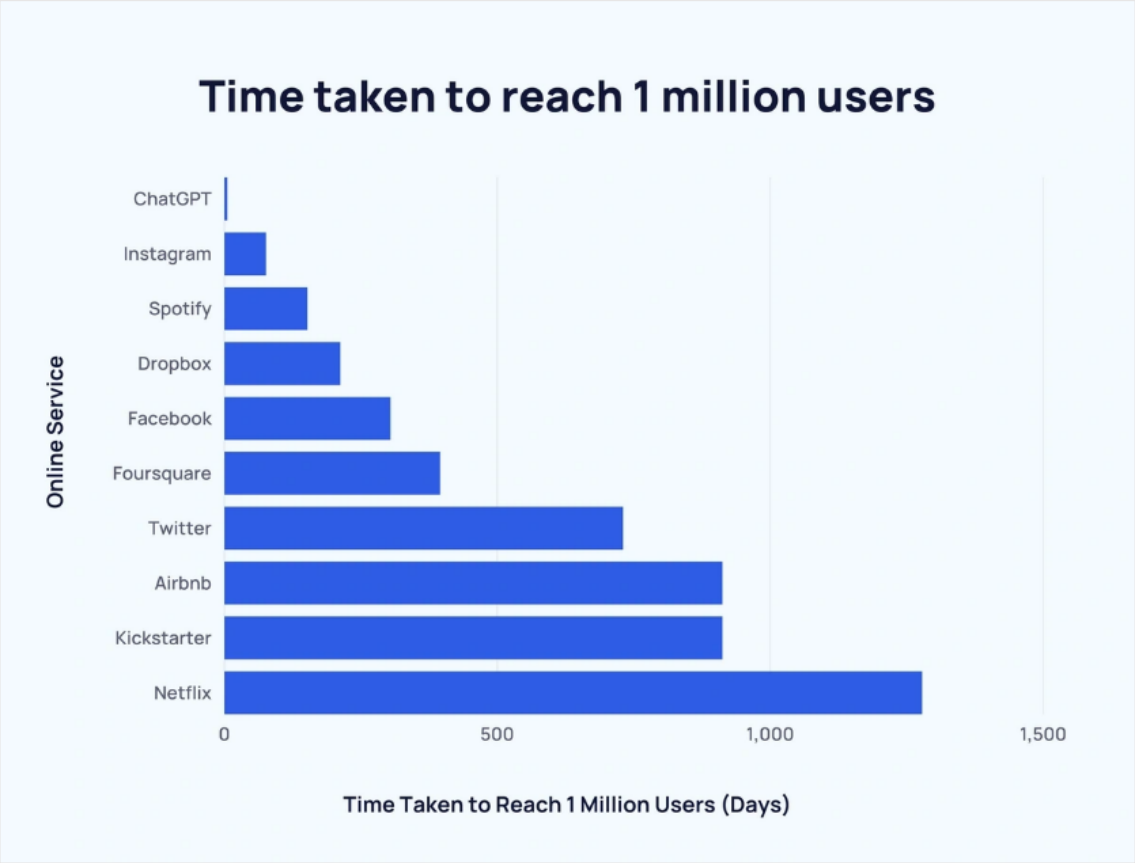



*Figure 2 – Time taken by ChatGPT to reach one million users.*
*Source: Exploding Topics (https://explodingtopics.com/blog/chatgpt-users)*

According to data from Exploding Topics (Duarte, 2023), ChatGPT garnered one million users within a mere five days, which is remarkably swift when compared to the adoption rates of other widely recognised online services, as depicted in Figure 2 above. For

instance, Facebook took a staggering 10 months to gather the same number of users. This exemplifies the immense interest and acknowledgment of the potential embodied by this tool. However, it also calls for thought regarding the implications of its extensive usage, which will inevitably result in an enhanced understanding of the technology but will simultaneously increase the likelihood of misuse.

### 2.2.4 Positive and negative impacts of Artificial Intelligence

The benefits of AI technology are evident and easily observable in our daily lives. Examples include the convenience of using Global Positioning System (GPS) navigation apps on our mobile devices to navigate efficiently, avoiding traffic congestion while moving from one location to another. Similarly, the ability to make phone calls or change radio stations in vehicles through voice commands contributes to enhanced driving experiences. More recently, the advent of generative AI with applications like ChatGPT and others that bring everyone with access to internet even closer to this technology. However, the positive and significant impact of AI extends beyond these everyday applications. Sectors such as healthcare and aeronautic safety, among others, benefit greatly from AI advancements, although their impact may not be as immediately visible in our daily routines. As referred by Prasad & Choudhary (2021, p. 8), Clinical Decision Support Systems (CDSS) are employed in medical data management to aid in medical prognosis within a particular domain or offer patient-specific recommendations. They have been shown to reduce mortality rates and lower the occurrence of life-threatening events. Similarly, Self-repairing Flight Control Systems utilised in aircrafts can identify damages within the aircraft and allow it to continue flying using the remaining intact components until it reaches a safe landing zone. (Prasad & Choudhary, 2021, p. 9) Examples could continue endlessly in several other areas, all of them with undeniable benefits for mankind.

These benefits have also been confirmed in a study made by a group of renowned scientists that delved into the effects of AI on the 17 UN Sustainable Development Goals (SDGs) and their 169 associated targets outlined in the 2030 Agenda for Sustainable Development. As can be seen in Figure 3 and stated by Vinuesa *et al.* (2020, p. 2), an examination of pertinent evidence reveals that AI can serve as a catalyst for progress in 134 targets (79% across all SDGs). This is primarily achieved through technological advancements, potentially overcoming existing limitations. However, the development of AI may have adverse effects on 59 targets (35% across all SDGs).

In this study, the SDGs were categorised into three main groups: Society, Economy, and Environment. Within the Society category, for example, AI demonstrated positive impacts on 67 targets (82%) related to SDGs such as no poverty, quality education, and clean water and sanitation. This positive influence stems from AI's ability to contribute to the provision of essential needs like food, health, water, and clean energy. However, there is a downside, with 31 targets (38%) facing potential negative consequences, for example in instances where AI demands additional job qualifications, exacerbating inequalities and hindering progress toward the no poverty goal. Similar findings were reported across the other categories.

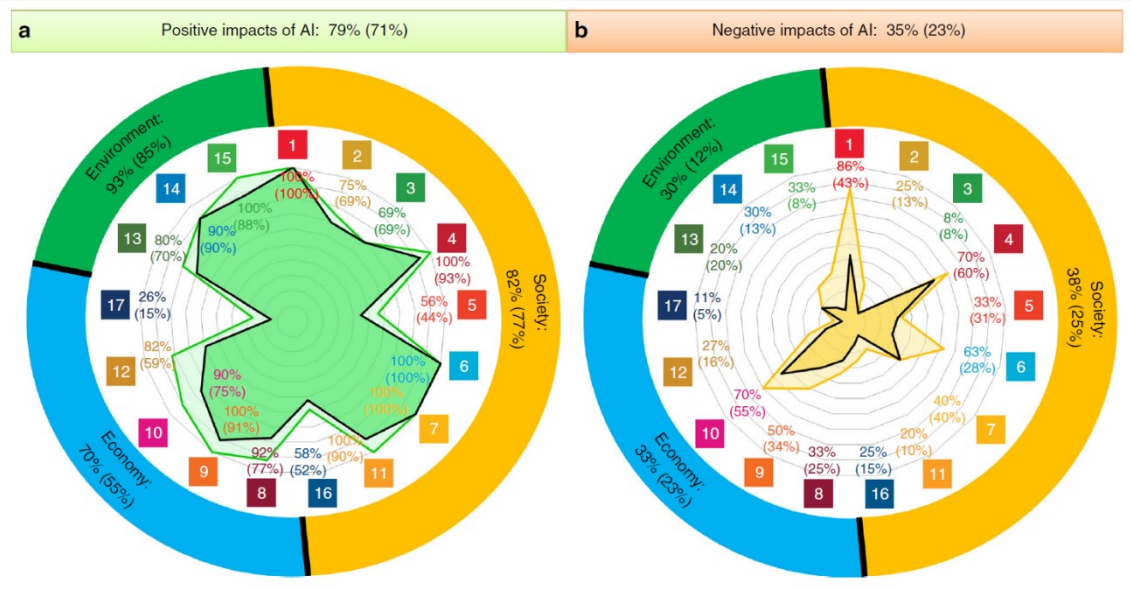



*Figure 3 - Positive and negative impact of AI on UN SDGs*
*Source: Vinuesa et al., 2020, p. 2*

Despite these challenges, it's essential to note that across all categories, the overall impact of AI is positive when comparing positive and negative effects. In the Economy category, 70% of targets benefit from AI, while 33% face negative impacts. In the Environment category, a remarkable 95% of targets experience positive effects, with only 30% facing adverse consequences.

### 2.2.5 Ethical concerns about Artificial Intelligence

Given the reality of AI's capabilities and widespread applications, it is reasonable to consider both the potential benefits and the need for caution regarding the technology's ethical implications. Throughout history, significant discoveries and advancements have had positive and negative consequences. Similarly, AI, with its immense power and diverse applications that contribute to the well-being of populations, can also be misused

and lead to short or long-term damages. Even when used responsibly, AI can have unintended side effects that are challenging to detect but can be harmful over time.

As a result, there are valid concerns at the heart of the current discussions surrounding AI. These concerns go beyond mere compliance with laws and regulations and delve into the realm of ethical principles. “With an analogy, it is the difference between playing according to the rules, and playing well, so that one may win the game.” (Floridi *et al.*, 2018, p. 6)

Ethical considerations in this field primarily revolve around fundamental principles such as human dignity, freedom, democracy, justice, equality, non-discrimination, and solidarity. These principles, identified by the High-Level Expert Group on Artificial Intelligence (AI HLEG), form the foundation for Trustworthy AI, as defined in the group's report *Ethics Guidelines for Trustworthy AI* (AI HLEG, 2019).

Another term frequently used when talking about ethical aspects in this field is Responsible AI. In the article *Responsible Artificial Intelligence: Recommendations and Lessons Learned*, the following definition can be found:

> A responsible, ethical, approach to AI will ensure transparency about how adaptation is done, responsibility for the level of automation on which the system is able to reason, and accountability for the results and the principles that guide its interactions with others, most importantly with people. In addition, and above all, a responsible approach to AI makes clear that AI systems are artefacts manufactured by people for some purpose, and that those which make these have the power to decide on the use of AI. (Dignum, 2023, pp. 199–200)

This passage incorporates crucial terms that form the foundation of Responsible AI: transparency, responsibility, and accountability. These concepts are managed by individuals who design and hold the authority to determine the applications of AI. In conjunction with the previously mentioned concept of Trustworthy AI, Responsible AI is steering some of the most influential sets of principles and regulations in this domain.

There are several factors contributing to the fears and concerns surrounding AI. First, the technology is primarily developed by the wealthiest nations, creating a potential gap between nations that have access to AI-based technology and those that do not. Second, AI relies on vast amounts of readily accessible data from the internet, often lacking

proper curation. Additionally, the inherent lack of transparency in the processing of data and presentation of results by AI systems raises further concerns.

Addressing these concerns is crucial to prevent potential negative outcomes, including:

- Deepening the divide between rich and poor countries due to limited access to AI-based technology.
- Exacerbating inequalities between educated and illiterate individuals, as the latter may struggle to utilise AI-based technology effectively.
- Discriminating against minority groups due to biased outcomes generated by AI-based technology.
- Losing control over AI-based technology processes and results, resulting in reduced human autonomy in decision-making.

Consequently, various influential international organisations, including the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Economic Forum, OECD, the European Commission, and prestigious universities worldwide, are actively studying, debating, and seeking to establish regulatory frameworks for AI ethics. A wealth of information and recommendations on this topic can be found on the internet from these reputable organisations. The common objective shared by these entities is to ensure that AI is developed and used in a manner that is human-centric, responsible and trustworthy. However, despite ongoing efforts to establish ethical principles surrounding AI, there exists a significant disparity in the approach taken by the United States (US) and the EU.

As can be seen in Figure 4 below, the US was the main worldwide contributor to the total investment in AI technology in 2020, with more than 55% of the global value. Nevertheless, it has embraced a liberal policy, with no intention on the part of the federal government to enforce regulations pertaining to AI. In contrast, the EU, which contributed with only 5% of the total investment value and is way behind China, the second largest investor in this area, is actively engaged, under the guidance of the European Commission, in the implementation of its AIA, designed to regulate the activities of stakeholders in the market and safeguard the interests of the population.

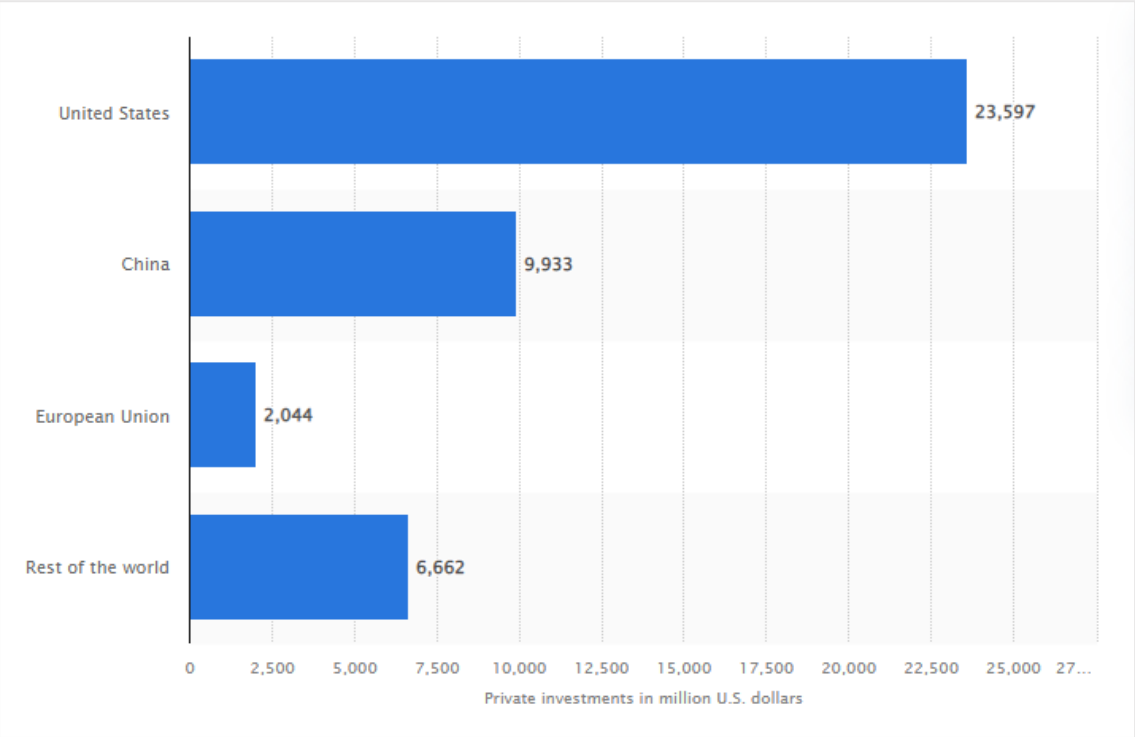



*Figure 4 - Private investments in AI in 2020, by geographical area*
*Source: Statista (https://www.statista.com/statistics/1226538/ai-private-investments-by-area/)*

Pazzanese (2020) highlights the absence of substantial government oversight in the US, allowing private companies to utilise AI software for crucial determinations in healthcare, employment, creditworthiness, and even criminal justice, without being held accountable for ensuring that these programs are devoid of structural biases, whether intentional or inadvertent. Consequently, the market relies solely on the discretion of companies to address ethical concerns during the design, development, deployment, and utilisation of AI technology. While some advocate for the regulation of AI usage, the majority does not see federal government bodies as competent entities capable of establishing rules and thoroughly evaluating every AI-based product. Pazzanese (2020) asserts that due to the rapid pace of technological advancement, even the most well-informed legislators struggle to keep up. Requiring pre-screening of every new AI product for potential social harm is not only impractical but would also impede innovation.

On the other hand, one of the European Commission's major priorities in this area is the AIA. After a long period of extensive discussions and negotiations, the European Parliament reached a provisional agreement with the Council, representing the 27 EU member states, on December 9, 2023. The agreed text was endorsed by the Members of the European Parliament (MEP), on March 13, 2024, with 523 votes in favour, 46 against and 49 abstentions. The law was then voted by the Council on May 21, 2024 and will enter into force 20 days after its publication in the Official Journal of the European Union (OJEU).

The AIA aims to establish a trustworthy AI system that encompasses three key components: lawfulness, ethics, and technical robustness. Floridi *et al.*, (2022, p. 3) emphasise that the underlying rationale of the document is to mitigate the risks of failure and lack of trust in AI through careful monitoring of the design, development, and usage of AI technologies, as well as comprehensive assessment of their ethical, legal, and social implications. To achieve this goal, the document initially outlined three primary risk categories into which AI systems must be classified, determining the corresponding regulatory requirements. These have been turned into four risk categories in order to accommodate the imposition of obligations on general purpose AI and generative AI models such as ChatGPT.

The first category, termed "unacceptable risk," encompasses practices known as "prohibited AI practices." These refer to "(…) all those AI systems whose use is considered unacceptable as contravening Union values, for instance by violating fundamental rights." (European Commission, 2021) Title II of the proposed AIA text provides a detailed list of systems or practices falling under this category, explicitly prohibiting their use in the European market.

> Accordingly, it would be prohibited to place on the market, put into services or use in the EU: (-) AI systems that deploy harmful manipulative 'subliminal techniques'; (-) AI systems that exploit specific vulnerable groups (physical or mental disability); (-) AI systems used by public authorities, or on their behalf, for social scoring purposes; (-) 'Real-time' remote biometric identification systems in publicly accessible spaces for law enforcement purposes, except in a limited number of cases. (Madiega, 2023, p. 4)

The second category, "high risk," includes:

> (…) AI systems that create a high risk to the health and safety or fundamental rights of natural persons. In line with a risk-based approach, those high-risk AI systems are permitted on the European market subject to compliance with certain mandatory requirements and an ex-ante conformity assessment. (European Commission, 2021, p. 6)

Title III of the proposed AIA text outlines the classification rules, legal obligations, and assessment procedures that apply to each type of high-risk AI system.

> The draft text distinguishes between two categories of high-risk AI systems: (1) Systems used as a safety component of a product or falling under EU health and safety harmonisation legislation (e.g. toys, aviation, cars, medical devices, lifts); (2) Systems deployed in eight specific areas identified in Annex III, which the Commission could update as necessary through delegated acts (Article 7): (-) Biometric identification and categorisation of natural persons; (-) Management and operation of critical infrastructure; (-) Education and vocational training; (-) Employment, worker management and access to self-employment; (-) Access to and enjoyment of essential private services and public services and benefits; (-) Law enforcement; (-) Migration, asylum and border control management; (-) Administration of justice and democratic processes. (Madiega, 2023, p. 5)

There is a third risk category, introduced after the voting by the EU Parliament in June 2023, referred to as “limited risk” which, as mentioned by Madiega (2023, p. 5), includes AI systems that interact with humans, like chatbots, emotion recognition systems, biometric categorisation systems, and systems that generate or manipulate image, audio or video content. These would be subject to a limited set of transparency obligations.

Lastly, the fourth category encompasses "low or minimal risk", also referred to as "non-high-risk" systems. It covers all systems that do not fall under the previous three risk categories. Title IX of the proposed AIA text stipulates that “[t]he Commission and

the Member States shall encourage and facilitate the drawing up of codes of conduct intended to foster the voluntary application to AI systems other than high-risk AI systems of the requirements set out in Title III (…)" (European Commission, 2021, p. 40)

Figure 5 below illustrates this risk-based approach in the form of a pyramid of risk:

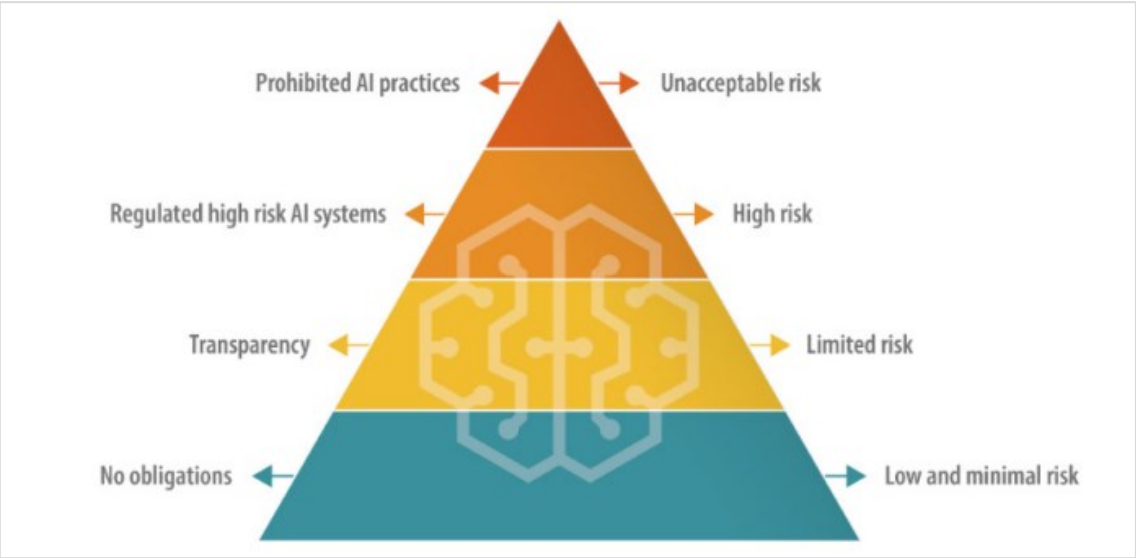



*Figure 5 - Pyramid of Risk*
*Source: Artificial intelligence act, EPRS | European Parliamentary Research Service, June 2023*

The AIA is meant to be adopted by all 27 member states during 2024. This will make the EU a leader in setting rules aiming at having a human centric and trustworthy AI.

In a more specific perspective, the paper *Ethical and social risks of harm from Language Models* proposes a structure to classify risk areas associated with large-scale Language Models (LMs). According to Weidinger *et al.* (2021, p. 1), a group of researchers from US, Canada and Irish Universities, in order to promote progress in responsible innovation, it is essential to have a thorough comprehension of the potential risks associated with these models.

The proposed structure "(…) outlines six specific risk areas: I. Discrimination, Exclusion and Toxicity, II. Information Hazards, III. Misinformation Harms, IV. Malicious Uses, V. Human-Computer Interaction Harms, VI. Automation, Access, and Environmental Harms" (Weidinger *et al.*, 2021, p. 1), and is a contribution to identify the ethical and social risks related with LMs in order to work towards responsible innovation in this area.

## 2.3 Machine Translation

As a particular instance of AI, the progress of MT has followed a somewhat comparable trajectory, although with distinctive features that deserve attention.

### 2.3.1 Brief history of Machine Translation

The idea that a machine could be used to aid in the translation process dates back to the seventeenth century. However, the first real approach to MT only appeared in the first half of the twentieth century with the patents on translation machines that Georges Artsrouni and Petr Troyanskii applied for in the 1930s. A couple of decades later, already in the era of computers, the patents became widely known. At the same time, the American mathematician and scientist Warren Weaver wrote a memorandum (Weaver, 1949) on the possibility of using the recently invented digital computers to translate documents between one natural human language and another. Warren Weaver was inspired by wartime successes in code breaking and the development of studies about information theory and the universal principles underlying natural languages. These two events, both the patents and the memorandum, gave way to a strong impulse in research around MT.

The first attempts were very limited in terms of vocabulary and grammar but were impressive enough to encourage strong investments in research in this area, both in the US and throughout the world. The first systems used bilingual dictionaries along with a set of grammar rules to ensure correct word order in the output. However, this approach was of limited use, and the need for a more systematic method was clear. Several projects came to life throughout the mid-1960s, based on new developments around linguistics, generating an optimistic wave that began to diminish as semantic barriers started arising, with no easy solutions.

In the US, the focus shifted to the development of Computer Assisted Translation (CAT) tools for nearly two decades, as "MT was slower, less accurate and twice as expensive as human translation". (Hutchins, 2014, p. 2) Nevertheless, other countries such as Canada, France, and Germany continued their research on MT, resulting in the creation of several systems throughout the 1970s.

With the spread of microcomputers and text-processing software in the 1980s, along with the growing need for translations due to the increase in commercial transactions worldwide, the market was open to cheap MT systems. Simultaneously, as referred by Hutchins (2014, p. 3), research around more advanced systems gained significant

momentum, culminating in a pivotal moment at the end of the decade when IBM achieved notable success with a project based on statistical methods. Japanese groups also made headway using example-based approaches. In the 1990s, research on speech translation, the marketing of the first translation memory systems, and the spread of internet access, with the need for automatic translation in applications such as email or webpages, turned MT systems into a mass-market product.

Soon, we entered the new millennium, with these two decades of the 21st century bringing enormous advances in this area. According to Hutchins (2014, p. 4), the statistical-based framework became dominant, mainly due to the availability of three important assets: i) large monolingual and bilingual corpora; ii) open-source software such as Moses or GIZA, which allowed the performance of basic statistical MT processes (alignment, filtering, reordering); iii) widely accepted metrics for evaluating systems, such as BLEU and successors.

The use of MT became widespread. Access by the general public started to be done mostly through online platforms like Google Translate, and an increasing number of large companies started to include MT in their activity. As a tool used in the professional field of translation, MT also started to gain its space, with language service providers (LSP) using it in conjunction with pre- and post-editing processes.

Overall, the history of MT has been marked by significant advancements and setbacks. While the early attempts were limited, they paved the way for more systematic approaches that continue to be developed today.

The development of AI algorithms for MT processes and the use of machine learning with complex deep learning neural networks are taking MT to the next level. State-of-the-art transformer networks (see Vaswani *et al.*, 2017), like Bidirectional Encoder Representations from Transformers (BERT) or GPT-4, are leading the way in language processing. Additionally, multi-platform MT systems, such as text-to-text, speech-to-text, text-to-speech, or speech-to-speech, are improving every day. Furthermore, advances in technology are enabling more and more minority languages throughout the world to use MT systems satisfactorily.

While this brave new world presents remarkable possibilities, it also harbours fears and uncertainties. MT can bring significant progress to humanity, but it also has the potential to be harmful. Therefore, there are a number of ethical questions and concerns that need to be addressed, the most important of which are looked into in the next section of this thesis.

### 2.3.2 Ethical concerns about Machine Translation

Notably, the book *Towards responsible machine translation: Ethical and legal considerations in Machine Translation*, edited by Moniz & Escartín (2023) has identified several ethical facets that need to be addressed in the context of MT. I intend to primarily depend on this source as a guide for presenting these aspects and incorporating them into the discussion when analysing the survey results in a subsequent chapter of this document. Nevertheless, it is important to mention that there are additional references to other significant articles which are pertinent to each particular ethical aspect deemed relevant and requiring attention. Specifically, these aspects encompass: concerns regarding copyright; safeguarding and security of data; the environmental impact of MT systems; biases, whether based on gender, race, ethnicity, or other factors; the utilisation of MT systems in crisis contexts; the quality of translated content; and the role and standing of translators.

#### *2.3.2.1 Copyright*

According to Forcada (2023, p. 2), language data for MT systems falls into two primary categories: resources like dictionaries and grammars, primarily used in rule-based MT systems, and corpora, consisting of sentence-aligned parallel data used to train statistical and neural MT systems. While the first type of language data does not raise copyright concerns, since it was specifically created to be applied in language-processing tasks, the latter was created for many different purposes but without considering its use in MT, which makes it relevant for some authors to question about whether or not they, alongside with translators, should receive additional compensation for the use these systems make of their work and the new value it generates.

This issue holds significant importance today, as leading MT systems require vast amounts of sentence-aligned parallel corpora for training. As a result, “(…) perhaps the largest source of sentence-aligned translations used to train MT systems comes from publicly-accessible documents published on the Internet either by manually scraping and aligning it, or either by automated crawling and alignment.” (Forcada, 2023, p. 8) Consequently, a substantial amount of the data used in training MT systems is not subject to copyright protection.

Another aspect of this issue relates to the raw translations generated by MT systems, which, although some argue will always need human post-editing, ideally done by a translator, are produced by machines trained on millions of text segments from various

authors and fed by linguists within engineer-created systems. Historically, it has been widely accepted that both the source text author and the translator (or translation agency, based on the agreement with the translator) share authorship and copyright of the translation. However, discussions around authorship of works generated by AI LLMs like ChatGPT or Dall-E are gaining momentum, with existing intellectual property legislation leaving many unanswered questions.

As previously discussed, the EU is actively seeking to regulate AI usage, with its AIA expected to be adopted by all 27 member states during 2024. Within this context, the European Parliament issued a *Report on intellectual property rights for the development of artificial intelligence technologies*, stating the following:

> At a time when artistic creation by AI is becoming more common (…), we seem to be moving towards an acknowledgement that an AI-generated creation could be deemed to constitute a work of art on the basis of the creative result rather than the creative process. (…) Therefore, it is proposed that an assessment should be undertaken of the advisability of granting copyright to such a 'creative work' to the natural person who prepares and publishes it lawfully, provided that the designer(s) of the underlying technology has/have not opposed such use." (Séjourné, 2020, p. 13)

This stance appears to be prevailing, but ongoing developments in this area require close monitoring.

#### *2.3.2.2 Role and status of the translator*

According to Moorkens & Lewis (2019)

> There is growing consensus that artificial intelligence (AI) will have a major impact on work and employment in high-skill tasks previously thought immune from automation. (…) The translation industry is at the forefront of addressing these changes as AI techniques applied to machine translation (MT) become an increasing factor in production of many commercial translations.

This serves as the guiding principle for the current section, where the focus is on exploring the impact of MT on the role of the translator and their status within the

translation ecosystem. As highlighted by Rico & del Mar Sánchez Ramos (2023), translators play a central role in the translation ecosystem, navigating technology, collaborating with various partners, and maintaining a distinct professional status. With the escalating prominence of MTPE in the translation process, there is a surging demand for post-editors. However, a critical question arises: does the status of the post-editor remain equivalent to that of the traditional translator?

In his article *'Time is money' and the value of translation,* do Carmo (2020) proposes a shift in perception regarding post-editing (PE), asserting that it should no longer be perceived merely as a time- and cost-saving strategy. Such a perception hampers the recognition of its specialised and expert dimension. Positioned as a new form of translation, PE represents a significant advancement in achieving the efficiency envisioned by human translation. The effectiveness of PE, as argued, demands complex decision-making, reinforcing the need for recognising post-editors as specialised knowledge workers.

This perspective attempts to address the earlier question, related to the equivalency of the post-editor's status to that of the translator by repositioning MTPE as an activity that is demanding, essential and specialised, comparable to the intricacies of translation itself. In the words of do Carmo (2020, p. 20), this recognition is essential to acknowledge the nuanced nature of PE and its contribution to the translation process.

Furthermore, Rico & del Mar Sánchez Ramos (2023) advocate for a re-evaluation of the translator's role in the face of technological advancements. They suggest that:

> (…) the numerous advances in technology call for a different view of the translator's role, one that places them at the core of the process and turns them into language advisors, dominating the translation ecosystem and deciding which tools to use, when and how. (Rico & del Mar Sánchez Ramos, 2023, p. 10)

#### *2.3.2.3 Bias*

According to *The Sustainable Development Goals Report* by UN's Department of Economic and Social Affairs (2023), discrimination affects close to one in six people globally, based on various factors. Racial discrimination, stemming from ethnicity, colour, or language, is prevalent among both women and men. Discrimination based on age and religion, although slightly less common, impacts women and men almost equally. Women are twice as likely as men to report discrimination based on sex and nearly twice

as likely to experience discrimination due to marital status. Persons with disabilities also face significant levels of discrimination, with one in three reporting such experiences, twice the rate compared to individuals without disabilities.

Against the backdrop of this scenario, NMT systems, which rely on extensive training datasets generated by millions of individuals, are susceptible to machine bias. As outlined by Rouse (2023), machine bias refers to the propensity of a machine learning model to produce inaccurate or unfair predictions due to systematic errors in the model or the data used for training. Various forms of machine bias can emerge, including:

- Predictive bias: The model tends to make specific predictions more frequently for certain demographic groups.
- Representation bias: Certain demographic data is inadequately represented or excluded during the training process.
- Measurement bias: The model is trained using unreliable, incomplete, or skewed data.
- Algorithmic bias: The model's design or the algorithm employed in its training inherently exhibits bias, often stemming from human error.

The article titled *Gender and Age Bias in Commercial Machine Translation* by Bianchi *et al.* (2023) presented the research conducted in this particular domain, with the primary goal of pinpointing potential gender and age biases within three widely used commercial MT systems: Google Translate, Bing Translator, and DeepL. The authors scrutinised the outputs of these three MT systems using data from an online reviews website. The objective was twofold: first, to assess the presence of bias, and second, to propose viable approaches for its mitigation or elimination.

In their study, Bianchi *et al.* (2023, p. 9) utilised a dataset sourced from Trustpilot, an online platform founded in Denmark in 2007, which facilitates user reviews and evaluations of diverse companies and services. The researchers specifically focused on reviews in English, German, Italian, French, and Dutch, guided by two predetermined criteria for their experiment. First, to ensure a fair comparison, they selected languages that were compatible with all translation systems under consideration. Second, they aimed to gather reviews that would serve as demographically representative samples of both the language and country.

Following an in-depth analysis of the provided datasets, Bianchi *et al.* (2023, p. 21) successfully demonstrated the existence of gender and age bias in MT. Their findings

revealed that translations generated by commercial systems tend to convey a text that appears to be authored by individuals who are more male and older than the actual source. This discovery contributes significantly to the expanding body of research on the topic, highlighting that language extends beyond mere information content to encompass crucial social dimensions. As the authors stated, these dimensions are fundamental for translations to convey the message full meaning:

> By giving those aspects more consideration, we can push the frontier of MT and move into stylistic aspects. On the other hand, by ignoring these aspects, we proliferate the status quo, resulting in uneven user experiences and translations that capture only half of what they should. (Bianchi *et al.*, 2023, p. 21)

It is crucial to be well-informed and vigilant about these biases to effectively eliminate them. This can be achieved through post-editing of raw outputs and/or, through the pre-editing of the training datasets and the source text that will be input into the MT system for translation.

This approach aligns with the perspective put forth by Ordorica (2021) in his article, *Avoiding Bias And Discrimination In Machine Translation*, published in Forbes Magazine. Ordorica (2021) emphasised the importance of this awareness, particularly for companies utilising MT systems for global communication with their clients. Recognising and addressing biases at both pre- and post-translation stages becomes paramount in fostering equitable and unbiased communication.

The author underscored that "[s]exism, racism and accuracy are still real issues, even with the best software." (Ordorica, 2021, sec. Methods Of Avoiding Bias In Your Translations) To address and mitigate biases in translations, he offered several pieces of advice, such as:

- Employing well-trained teams[3]: utilise teams that are adequately trained and possess an awareness of the risks associated with MT. These teams should be capable of scrutinising and mitigating errors that may arise during the translation process.
- Implementing reporting and auditing mechanisms: establish reporting and auditing procedures for MT results, involving third-party auditing teams. Display the outcomes

[3] The author describes teams as comprising all individuals engaged in handling MT outputs within a company utilising these systems to communicate with its audience, including managers, lawyers, customer service representatives and others.

publicly and incorporate a disclaimer at the conclusion of translated pieces to keep customers informed about the origin of the text.

- Ensuring clarity in source text: guarantee that the source text consists of clear statements and questions. Avoid complex thoughts, intricate phrases, clichés, or cultural sayings, as these may pose challenges for accurate translation. Simplifying the source text enhances the likelihood of correct and unbiased translations.

#### *2.3.2.4 Quality*

Quality has perpetually stood out as a paramount ethical concern for professional translators. As highlighted in the initial section of this chapter, a brief examination of codes of ethics from various professional translator associations consistently reveals references to terms such as "standards of quality," "professional competence," "accuracy," and "faithfulness." Therefore, a translator is much more than just “a person who translates writing or speech into a different language, especially as a job”. (‘Translator’, 2024)

As per the European Committee for Standardization (2015), professional translators are expected to possess a range of competencies including: (a) translation competence, (b) linguistic and textual competence in the source language and the target language, (c) competence in research, information acquisition, and processing, (d) cultural competence, (e) technical competence and (f) domain competence. These competencies collectively contribute to achieving the high standards of quality ingrained in translators' training and practices. However, the introduction of MT systems brings up varying degrees of quality, depending on the context in which MT outputs are used. This poses a challenge and constitutes an ethical dilemma for translators, as it contradicts their constant pursuit of consistently high-quality translations.

In a pertinent article on this subject, *The Ethics of Machine Translation Post-editing in the Translation Ecosystem*, Rico & del Mar Sánchez Ramos (2023), contemplated the transformative impact that Machine Translation Post-Editing (MTPE) is bringing to the translation ecosystem, particularly focusing on the human role within the MT context. They analysed “three specific ethical dilemmas: a) Dilemma #1: the post-editor’s status; b) Dilemma #2: the post-editor’s commitment to quality; and c) Dilemma #3: digital ethics and the post-editor’s responsibility.” (Rico & del Mar Sánchez Ramos, 2023, p. 1)

Delving into Dilemma #2—the post-editor’s commitment to quality—the authors pondered the nuanced understanding of quality in the context of MT. Initially, it might seem that the final outcome of a post-edited MT output should mirror the end result of a

human translation in all aspects, including overall quality. However, the quality of the post-edited MT output may hinge on various factors, such as the target audience, the intended purpose of the final text, or pre-established agreements with the client or end user. Concepts like "light post-editing" versus "full post-editing" (see Hu & Cadwell, 2016) or the juxtaposition of "good enough quality" (see Massardo *et al.*, 2016) and "human translation quality" come into play. Productivity, as highlighted by Rico & del Mar Sánchez Ramos (2023), is also entangled in this discourse; it serves as a primary motive for using MTPE but simultaneously poses a risk to the quality level of the target text.

Consequently, the authors suggested that

> [t]he post-editor's commitment to quality is then linked to the specific use of technology and allows for broader and adaptable requirements in quality which include such factors as human time, human judgements of linguistic quality, and to productivity measured in terms of terminological consistency and usability. (Rico & del Mar Sánchez Ramos, 2023, p. 12)

#### *2.3.2.5 Data safety and protection*

The matter of data safety and protection poses a significant concern in the realm of MT systems, especially when considering their utilisation by professional translators who frequently handle confidential client information.

In the article *Privacy and everyday users of machine translation*, Nunes Vieira *et al.* (2022) examined the behaviour of everyday users of MT and their awareness of privacy concerns. As per the authors' perspective, everyday users of MT are individuals who employ MT in casual settings, utilising free online MT tools offered by internet companies whose operations are dependent on users' data. This underscores the critical significance of privacy concerns. While this demographic is not specifically categorised as professional translators, the subject of this thesis, it could be worthwhile to explore the article's insights regarding the perception of data safety held by these users. Subsequently, a comparison can be drawn between these insights and the findings gleaned from the research in this thesis.

In their article, Nunes Vieira *et al.* (2022, p. 17) identified two primary perspectives on privacy in the everyday usage of MT. First, users may harbour apprehensions about the potential exposure of the information they provide to MT systems. These concerns

typically revolve around incidental sharing of content such as images, passwords, or contact details, rather than the actual content intended for translation. Second, an unexpected finding is that certain users perceive MT as a means of safeguarding privacy, valuing it for its ability to offer a level of confidentiality. The authors hypothesised that this second aspect might be linked to the capability of MT systems to enable users to communicate without seeking assistance, justifying the inadvertent sharing of information with MT providers. Additionally, the fact that these users are not using MT specifically for professional purposes and the lack of confidentiality obligations to clients might also contribute to this phenomenon.

In another article by Trancoso *et al.* (2023), the authors endeavoured to run through several privacy and security concerns that are raised by the use of speech technologies accessed at remote servers. Once again, this is not narrowly focused on the professional translators' utilisation of MT systems but rather takes a broader perspective in terms of users, although specifically examining speech translation. Therefore, it offers a distinct angle on the data security concern, gaining prominence as speech MT systems evolve. The authors asserted that, when deploying MT systems for speech translation, the inputs incorporated not only linguistic content but also various paralinguistic or extra-linguistic information referring to entities such as a person, a location or an organisation (see Jurafsky & Martin, 2024, p. 167), and that the server could potentially utilise this information to create a user profile for alternate purposes. Furthermore, speech inputs could be harnessed to construct text-to-speech synthesisers mimicking the speaker's voice, susceptible to misuse. “Achieving a balance between privacy and utility in speech technologies deployed in remote servers is a difficult goal, but it becomes much harder when such technologies are combined in complex speech-to-speech MT systems.” (Trancoso *et al.*, 2023, p. 14) The authors concluded that collaboration across different communities, including speech research, cryptography research, and legal communities, is imperative to establish "(...) standards and procedures that protect the privacy of the individual in speech communication while providing sufficient means and incentives for industry to exploit towards future innovative services.” (Trancoso *et al.*, 2023, p. 14) These represent two distinct facets of the same ethical challenge necessitating attention for the ethical and secure use of MT systems.

#### *2.3.2.6 Crisis contexts*

One of the most admirable applications of MT lies in its ability to contribute to emergency situations, crises, catastrophes, or, more broadly, contexts involving underserved groups. The pivotal advantage of MT in such scenarios is its potential to eliminate

language barriers, facilitating a shared understanding between all parts involved. However, ethical concerns have surfaced in this domain, prompting research aimed at scrutinising the merits and drawbacks of incorporating MT in crisis contexts.

In their article titled *Machine Translation and Fair Access to Information*, Nurminen & Koponen (2020) showcased projects in which MT has been deployed to enhance information accessibility for underserved groups. Moreover, they delved into ethical dilemmas surrounding quality, acceptability, and stakeholder involvement in the development process.

Upon analysing the presented projects, the authors emphasised the value of having diverse stakeholders involved, including organisations championing accessibility, technical experts, prospective system users, and language professionals. These best practices, as per Nurminen & Koponen (2020, p. 17), should encompass ethical considerations such as safeguarding potentially sensitive data and duly acknowledging stakeholder contributions.

Addressing quality and acceptability concerns, the authors acknowledged “(…) that there are contexts in which raw, unedited MT might be useful. However, we encourage stakeholders to carefully analyse contexts for suitability before implementing raw MT, taking into consideration quality issues and other aspects of acceptability.” (Nurminen & Koponen, 2020)

Another pertinent article explores MT's role in crisis situations. It is titled *Ethics, Automated Processes, Machine Translation, and Crises*, and the authors (Federici *et al.*, 2023) reflected on automated translation processes concerning preparedness, crowdsourcing and data mining, local vs. global crises, and multimodal communication demands.

Upon an extensive analysis of these dimensions and their associated ethical challenges, Federici *et al.* (2023) concluded that the fulfilment of the UN's commitment to "leave no one behind" as outlined in the 2030 Agenda for Sustainable Development and its SDGs is currently uncertain and seems projected into a distant future. Inequities persist in accessing information and infrastructures for data management and storage. The authors stressed the quintessential role of language in establishing successful communication channels, lending trustworthiness to diverse voices and speakers.

Towards the article's conclusion, four recommendations were presented, showcasing the major importance of MT in crisis contexts and proposing a set of best practices for an ethical and responsible utilisation of this technology:

> (…) that applications and uses of automation processes of translation have a central role to play, together with human interaction, in increasing preparedness, but more focus is needed on the human-computer interaction and the role of humans in quality assurance processes.
>
> (…) that T&I[4] automation processes must be part of the lifecycle of crises and not just of the response phase.
>
> (…) that to reduce ethical concerns about the application of MT and automation processes to crisis communication, these must be embedded in global platforms that aim to reduce risks, but their limitations must be critically explained to users.
>
> (…) [that] scholars in T&I, audiovisual software developers, and MT researchers [should] enlarge and systematise research on the usage of AVT[5] in crises, as multimodal transfer of information is becoming ever more central to people's lives and it reduces accessibility and economic barriers, while increasingly adopting multi-layered forms of automation in its translation workflows. (Federici *et al.*, 2023, p. 24)

#### *2.3.2.7 Ecological footprint*

The progress made in MT in recent years has resulted in the widespread adoption of Neural Machine Translation (NMT), effectively supplanting Rule-Based Machine Translation (RBMT) and Statistical Machine Translation (SMT) systems. According to Shterionov & Vanmassenhove (2023, p. 4), this transition imposed a shift in the core processing technology. The training of neural networks implies the manipulation of large matrices and in order for all the matrix-operations to perform efficiently, they must occur within high-capacity Graphics Processing Units (GPUs), instead of general-purpose

[4] Translation & Interpreting

[5] Audiovisual Translation

Central Processing Units (CPUs), which have lower processing and memory capacities. These GPUs, which are much more power demanding than CPUs, remain operational for long periods of time, leading to the consumption of significant amounts of energy and the release of substantial volumes of $CO_2$. This situation raises ethical concerns in a world where environmental considerations play a pivotal role in shaping the future of the planet. Given this context, how can the current landscape align with initiatives such as the EU Green Deal (European Commission, n.d.) that aims at:

- Turning EU into the first climate-neutral continent by 2050;
- Having at least 55% less net greenhouse gas emissions in the EU by 2030, compared to 1990 levels;
- Having 3 billion additional trees to be planted in the EU by 2030.

In the article *The Ecological Footprint of Neural Machine Translation Systems*, Shterionov & Vanmassenhove (2023) analysed the impact of these systems' performance both in terms of power consumption and of carbon dioxide emissions. For that purpose, they tested different NMT models — Transformer and Long Short-Term Memory (LSTM) — running in different types of GPUs, analysing the time needed to both train and use the systems for translation. The authors also considered two countries with distinct distributions of energy sources, with one relying more on fossil fuels and the other prioritising renewable energy, which also impacted the analysis on the ecological footprint of the systems. The conclusion was that the Transformer models are faster and more efficient in terms of power consumption at train time, but LSTM models perform better both in terms of speed and power consumption at translation time. One model stood out among the GPUs tested, demonstrating superior performance in nearly every scenario, despite its higher cost.

To put things into perspective and give a clear example of the measurements presented in this article, Shterionov & Vanmassenhove (2023, p. 17) stated that the $CO_2$ emissions of a GPU workstation, used in its full capacity during one year to train simple models, are equivalent to the emissions generated by the electricity consumption, during the same period, of two small households in the United Kingdom (UK), i.e., approximately 2 500 kg of $CO_2$.

In their call for a more environmentally sustainable AI, the authors "(…) aim to motivate researchers to devote time, effort and investment in developing more ecological solutions." (Shterionov & Vanmassenhove, 2023, p. 21) To achieve this goal, they are exploring various strategies such as conducting model reusability and multi-objective

optimisation of hyperparameters. These approaches aim to mitigate the environmental impact of NMT systems.

Another interesting exploration, aligning with the research of Shterionov & Vanmassenhove and shedding light on the magnitude of this concern, while also proposing various paths to reduce the ecological footprint associated with the training of LLMs, is outlined by Anthony *et al.* (2020). The authors began their discussion by affirming that should the exponential growth in Deep Learning (DL) computational processing power persist, Machine Learning (ML) could emerge as an important contributor to climate change. Building upon this premise, they presented strategies aimed at mitigation, chiefly focusing on methods to improve the energy efficiency of DL processes. Furthermore, they advocated for heightened awareness among stakeholders regarding their energy usage and carbon emissions, encouraging them to proactively seek opportunities for reduction.

A pivotal aspect in augmenting this awareness is the tool presented in the article, called carbontracker, which, as defined by the authors is "(…) a tool for tracking and predicting the energy and carbon footprint of training DL models." (Anthony *et al.*, 2020, p. 1) The authors argued that by employing this tool, stakeholders could adopt measures to reduce the carbon footprint without compromising the quality of the training for DL models. Some of the measures recommended by (Anthony *et al.*, 2020, pp. 3–4) included:

- Utilising "Low Carbon Intensity Regions": Regional disparities in the carbon intensity of electricity production depend on the energy sources fuelling the respective local power grids. Examining the 2016 average intensities reveals a stark contrast since a model trained in Estonia could potentially emit over 61 times the $CO_2$ compared to its counterpart trained in Sweden.
- Considering "Training Times" with low carbon intensity: The timeframe during which a DL model undergoes training significantly impacts its carbon footprint due to fluctuations in carbon intensity throughout the day, corresponding to shifts in energy demand and the capacity of energy sources. For instance, a model trained during periods of low carbon intensity in Denmark could potentially emit as little as one-fourth of the $CO_2$ emitted by a model trained during peak hours. Similarly, a comparable pattern is observed in Great Britain, where emissions could be halved by training models during optimal periods.
- Employing "Efficient Algorithms": Considering the quick reference definition of algorithmic efficiency provided by Daintith & Wright (n.d.), which describes it as a measure of the average execution time required for an algorithm to complete tasks

on a dataset, employing efficient algorithms during the training of DL models can additionally aid in minimising compute resources, consequently leading to a reduction in carbon emissions.

- Opting for "Efficient Hardware and Settings": Enhancing the energy efficiency of computing hardware and configurations can also play a role in decreasing carbon emissions.

### 2.3.3 Previous research on translators' awareness and use of Machine Translation

Although, as discussed previously, there is not many available information about the professional translators' awareness of the ethical concerns related to the use of MT systems, there are some studies that focus on the awareness and usage of MT systems by professional translators. Therefore, due to the relevance and connection with the theme of this thesis, I am including a summary of the ones I find most pertinent in the field.

The first survey that I found of interest is presented in the article *Resistance and accommodation: factors for the (non-) adoption of machine translation among professional translators*. The authors, Cadwell *et al.* (2017), conducted a study involving two distinct groups of professional translators: the European Commission's Directorate-General for Translation (DGT) and Alpha CRC, an LSP located in the United Kingdom. Their primary objective was to explore the factors that play a role in whether professional translators choose to adopt or refrain from using MT and, for that purpose, they formulated the following questions for which they aimed to obtain answers:

- "Do participants use MT in their work?
- What reasons do participants advance for their adoption or non-adoption of MT?
- What could account for the reasons put forward by participants?" (Cadwell *et al.*, 2017, p. 304)

Following a thorough analysis of the collected data in order to answer the questions above, Cadwell *et al.* (2017, pp. 309–315) noted that the majority of the participants used MT in their work. The reasons for the adoption or non-adoption of MT varied widely among participants, with significant associations found with factors such as text type, language pairs, quality considerations, and trust levels. Some participants noted speed and productivity gains, although others found that MTPE could be more time-consuming and demanding than translating without MT. Terminology consistency was cited as both

a positive and negative factor. Additionally, concerns were raised about MT disrupting the translator's thought process and creativity, although some viewed MT as a valuable source of inspiration or a helpful tool to jump-start a translation. Furthermore, the study noted that a specific group of translators (DGT) showed a higher openness to MT adoption, suggesting that the socio-technical context of implementation may shed light on this difference.

Another interesting survey related to this field is presented in the article *What Do Translators Think About Post-Editing? A Mixed-Methods Study Of Translators' Fears, Worries And Preferences On Machine Translation Post-Editing* by Pérez Macías (2020). In this article, the author conducts an analysis based on data collected through a focus group session involving five professional translators and a survey that received responses from 104 professional translators.

According to Pèrez-Macías (2020), the primary objective of the study was to offer a broader perspective on the collective sentiment within the professional translator community regarding PE of MT outputs. The study places a specific emphasis on the Spanish context, providing valuable insights into the primary concerns, anxieties, and preferences within the realm of professional translation.

The outcomes of this investigation suggest that participants generally hold a relatively more positive outlook on PE when compared to the findings of other studies, such as those conducted by Rico & García (2016), Torres-Hostench *et al.* (2016), and Pérez-Macías *et al.* (2020). However, it is worth noting that PE still falls behind CAT tools, which have a more established presence in the market.

According to Pérez Macías (2020, p. 30), there is a general perception that projects using PE can potentially be more profitable than they are today. Nowadays, although the rates charged are low, there is still the need to invest a lot of time on each project. The author suggests that advancements in MT systems and the enhancement of their outputs could help save time on projects and thus, increase profitability. Additionally, because PE is relatively new, there is a lack of clear guidance on various aspects such as whether clients need to be informed about its use, if rates should differ from regular translation, or what factors should be considered when pricing such projects. The author recommends establishing a specific code of ethics for PE practice since current guidelines provided by different entities are insufficient to address all the needs and concerns of the translation industry in this area.

A third survey that is worth noting is discussed in the article titled *Do translators use machine translation and if so, how? Results of a survey held among professional translators* (Farrell, 2022). In this article, the author provides an account of the findings derived from a survey conducted among 452 professional translators. In this case, the primary objective was to gain insights into the extent to which translators incorporate MT into their translation processes and the various methods they employ for its integration. (Farrell, 2022, p. 1)

Upon collecting and analysing the data, the author arrived at several key conclusions. Notably, the study found that translators with greater experience are less inclined to accept MTPE assignments compared to their less experienced counterparts. However, both groups are equally likely to use MT in their own translation workflows. Furthermore, translators working with languages that have limited resources are also less inclined to accept MTPE tasks, although no such correlation exists regarding their use of MT in their individual workflows. Another noteworthy aspect uncovered in the study was the practice of using MT in other ways than just for MTPE:

> When left to their own devices, only 18.57% of the 69.54% of respondents that declared that they use MT while translating always or usually use it in the way the pioneers of MT envisaged, i.e., MTPE. Most either usually or always prefer to use MT in a whole range of other ways, including enabling MT functions in CAT tools and doing hybrid post-editing; using MT engines as if they were dictionaries; and using MT for inspiration. The vast majority of MT users see MT as just another tool that their clients do not necessarily need to be informed about. (Farrell, 2022, p. 11)

# 3. Methods

The central component of this research involved a comprehensive survey designed for professional translators. Irrespective of their areas of expertise, the survey targeted individuals whose working languages include European Portuguese and/or Finnish.

This survey was the product of a collaborative effort with a master's student from Tampere University in Finland. It was approved by the Ethics Committee of the Lisbon University School of Arts and Humanities[6] and conducted with the support of the Portuguese Association of Translators (APT), as well as of the Finnish Association of Translators and Interpreters (SKTL). Its primary objective was to acquire pertinent information to address the following inquiries:

1. To what extent are translators familiar with MT?
2. What are the perceived implications of MT on the translators' professional activities?
3. How aware are translators of MT ethical implications?

Our intention was to collect quality data, enabling us to gauge the influence of MT and AI on the work of professional translators. By attaining meaningful perceptions, we also aimed to provide insights that can contribute to addressing the ethical challenges associated with this subject. Upon outlining the objectives of our survey, we proceeded with a comprehensive methodology that encompassed several stages.

We commenced by defining the target audience for the survey, which we identified as professional translators, regardless of their specific fields of expertise. The primary criterion was their competence in either European Portuguese or Finnish as one of their working languages.

Our firm belief that the target audience would consist solely of professional translators, deliberately excluding translation students, stemmed primarily from two key factors: first, from my initiative to conduct this research, driven by my own lack of confidence in my role as a professional translator regarding the ethical utilisation of MT and AI. This uncertainty arose due to the absence of readily available guidelines on the subject. This lack of confidence was further intensified when I returned to the university after a 30-year hiatus from academia and discovered that my colleagues, who were much younger and more inclined towards technology, were equally unsure about how to ethically employ

[6] See a copy of the approval request and of the Ethics Committee declaration in annexes II and III

these tools. Therefore, it seemed important to try to evaluate if this was also the case with the majority of professional translators, which had already concluded their studies in translation and were actively working in the filed or if, on the contrary, these professionals were familiar with this technology and aware of its ethical implications. The second rationale for defining this target group was the scarcity of research addressing the ethical concerns surrounding the utilisation of MT by professional translators. While existing studies focused solely on usage aspects, our aim was to delve into the ethical considerations that could influence the appropriate handling of MT.

This shared foundation would allow a comparative analysis of Finnish and Portuguese contexts, enabling us to draw some conclusions. However, it is worth noting that the analysis of results extended beyond this specific comparison.

The subsequent step entailed determining a sample size that would ensure robustness and credibility, thus lending weight to the results and enabling us to draw pertinent conclusions that could encourage further research and promote ethically sound behaviours regarding the use of this technology. With the support of both the Portuguese and Finnish Translators' Associations in the survey's release, we set a minimum target of acquiring 30 respondents for the Portuguese version and 50 respondents for the Finnish version. This variance in respondent numbers for each country stemmed from the fact that, while the Finnish population is approximately half that of Portugal's, the Finnish association boasts more than double the membership of its Portuguese counterpart.

Having defined the goals and target audience, we proceeded to craft the survey. This phase, spanning approximately three months, involved collaborative efforts between the Portuguese and Finnish teams, iteratively refining the survey through multiple rounds of revision to align the questions with the initially established objectives.

We formulated a comprehensive set of 36 questions to thoroughly explore the key aspects related to the research questions identified earlier. Striking a balance between the need to collect relevant information and maintaining a reasonable survey length to avoid respondents from giving up before reaching its end, we employed clear language and an easily navigable format.

The survey was structured into five distinct sections, each focusing on different aspects: (a) translators' knowledge and usage of MT, (b) Chat GPT, (c) the impact of MT on translators' work, (d) ethical concerns, and (e) translators' background. The sequence in which these sections were presented to the participants was carefully considered.

Section (a), which focused on translators' knowledge and use of MT, took precedence. This strategic placement allowed for an immediate assessment of respondents' familiarity with the technology, thus setting the context for the subsequent survey questions. Following this, section (b), Chat GPT, was introduced later in the survey's development. This decision was influenced by the hype around generative AI and specifically around this model, which gained significant traction since its public release. Acknowledging its relevance in the translation landscape, although not specifically as an MT system, we incorporated this section to further understand how aware the respondents were about its functionalities and to what extent they used it in their work. Subsequently, section (c), the impact of MT on translators' work, naturally followed, building upon the information gathered regarding the familiarity and usage of MT systems. This stage provided an opportunity to evaluate the tangible impact of these technologies on translators' professional practices, with insights already contextualised by preceding responses. Section (d), ethical concerns surrounding MT, allowed for a deeper exploration of the subject matter. Utilising Likert scale questions and open-ended prompts, we sought to capture nuanced perspectives, encouraging participants to express their opinions and insights comprehensively. Finally, section (e), focusing on the translators' backgrounds, was intentionally placed at the conclusion of the survey. Typically found at the outset of surveys, its strategic positioning at the end ensured that respondents would not be deterred by its length, allowing them to engage fully with the survey's substantive content.

As soon as the structure and questions were defined and agreed upon, an initial English draft version in MS Word format served as a shared foundation for both teams, facilitating subsequent translations into Portuguese and Finnish. We then had to determine the most suitable platform for publishing the survey, ensuring online accessibility for respondents. After some research, we concluded that Google Forms was the optimal choice for the Portuguese survey due to several reasons. First, it offered ease of use and access, encompassing all the functionalities essential for the structure we had designed. Additionally, it was conveniently integrated into the IT resources available to students at the School of Arts and Humanities of the Lisbon University. Similarly, for the Finnish survey, Microsoft Forms was selected for the same reasons.

Although we initially derived a final English version from which the Portuguese and Finnish versions would be generated, our workflow began with translating the Portuguese version to facilitate its integration into Google Forms, alongside the English version, initiating the testing phase. This process was conducted within a controlled

environment. Owing to variations in the academic calendars of Portugal and Finland, testing commenced in May 2023, exclusively with Portuguese translators who evaluated both the Portuguese and English versions of the survey, thereby validating the version for translation into Finnish. To accomplish this, we enlisted six professional translators meeting the predefined criteria, divided into two groups.

We initially sought feedback from three professionals who possess 10-20 years of experience in the development and training of MT systems. Their valuable comments resulted in necessary adjustments to the survey. Subsequently, we engaged three professional freelance translators with over 20 years of experience, working across diverse areas of expertise, to test the survey. The feedback received from these participants was also carefully considered and incorporated into the final version of the survey. Feedback encompassed aspects such as the responsiveness of the form, the questions' structure, or the absence of information on specific, relevant aspects of the subject matter.

Upon successfully uploading the final version of the Portuguese survey into Google Forms, we commenced its release in the first week of July 2023. Respondents were provided with a link to access the questionnaire, which was distributed to members of the APT and various professional translation groups on social media platforms, predominantly Facebook and LinkedIn. Additionally, we leveraged our personal contacts to augment the survey's outreach. Subsequently, in late October 2023, a similar approach was adopted by the colleague in Finland for the distribution of the Finnish version of the survey. This involved sharing it through the SKTL newsletter, sent to its associates by email, as well as reaching out to other professional translation groups and our personal network.

Regarding the Portuguese survey, we maintained ongoing communication with potential participants for a period of two months, resulting in the successful collection of 34 responses by mid-September 2023. It is pertinent to note that two responses were excluded as they were provided by native speakers of Brazilian Portuguese, falling outside the specified scope of the survey. Thus, we obtained 32 valid responses, representing approximately 11% of the total APT membership[7]. As for the Finnish survey, the response period extended until the second week of December, during which my colleague accumulated a total of 53 valid responses, thereby initiating the subsequent

[7] https://www.apt.pt/socios/pesquisa

analysis phase. It is worth mentioning that the number of responses is fairly small and cannot be considered representative of the whole population of Portuguese or Finnish translators. Nevertheless, this response rate was deemed robust enough to commence the analysis phase, with the objective of deriving meaningful conclusions.

Given our choice of Google Forms as the survey tool, we were able to automatically store all responses in an Excel file, ensuring the secure handling of data. This Excel feature proved immensely beneficial for confidential data treatment and analysis. It facilitated tasks such as sorting, filtering, and generating graphics and tables with conditional formatting, offering immediate visual insights into response trends.

We commenced by meticulously sorting and organising the data before proceeding to generate corresponding graphics and tables for inclusion in this document. Simultaneously, we explored potential correlations between different sets of data from various questions to enrich our analysis and develop comprehensive respondent profiles and response trends. This laid the foundation for the Results chapter of this thesis, which presents the Portuguese results first, in section 4.1, having each survey question displayed alongside respondent answers in graphical or tabular format, accompanied by brief narratives highlighting key insights.

Moreover, it was imperative to conduct a comparative analysis of results obtained from both the Portuguese and Finnish surveys. We sought to ascertain whether meaningful differences or similarities existed between the two countries, considering their diverse geographical, climatic, and demographic attributes, as well as cultural and societal norms. To facilitate this comparison, we meticulously examined each question and its corresponding answers, identifying those that exhibited notable differences or similarities between the Portuguese and Finnish datasets. Subsequently, we selected relevant questions for comparison and presented the data through graphics or tables, complemented by commentary on the most intriguing findings in section 4.2 of the Results chapter. These comparative analyses led to the conclusions presented in the final chapter of this thesis.

# 4. Results

As mentioned previously, we initiated this survey with the intent of addressing three primary questions:

1. To what extent are translators familiar with MT?
2. What are the perceived implications of MT on the translators' professional activities?
3. How aware are translators of MT ethical implications?

These inquiries have gained considerable importance in recent months due to the accelerating adoption of MT on one side, and the advent of ChatGPT and the expanding availability of generative AI models on the other. These two factors are reshaping the landscape of translation and have surpassed our initial expectations when we first considered conducting this survey.

This chapter is divided into two main sections. The first section is focused on presenting the survey results from Portugal, while the second section is centred on comparing the results from Portugal with those from Finland.

## 4.1 Portuguese survey results

This section provides an overview of the findings from the Portuguese survey, employing the same framework utilised in the survey itself. However, two alterations have been made in the presentation order. This first one is the respondents' profile subsection—originally positioned as the final segment of the survey—now being presented at the outset. This adjustment has been made to enhance the contextual understanding of the subsequent answers provided by the respondents. The second one is the ChatGPT subsection which has been moved to the end of this section to uphold the focus on MT and Ethics results, which constitute the core of this research work.

### 4.1.1 Respondents' profile

We started by examining the profile of the translators who participated in the survey.

#### *4.1.1.1 Nationality and country of residence*

Out of the 32 valid responses we received, 93.8% were from Portuguese participants. The remaining 6.2% were evenly split between Italians and British respondents.

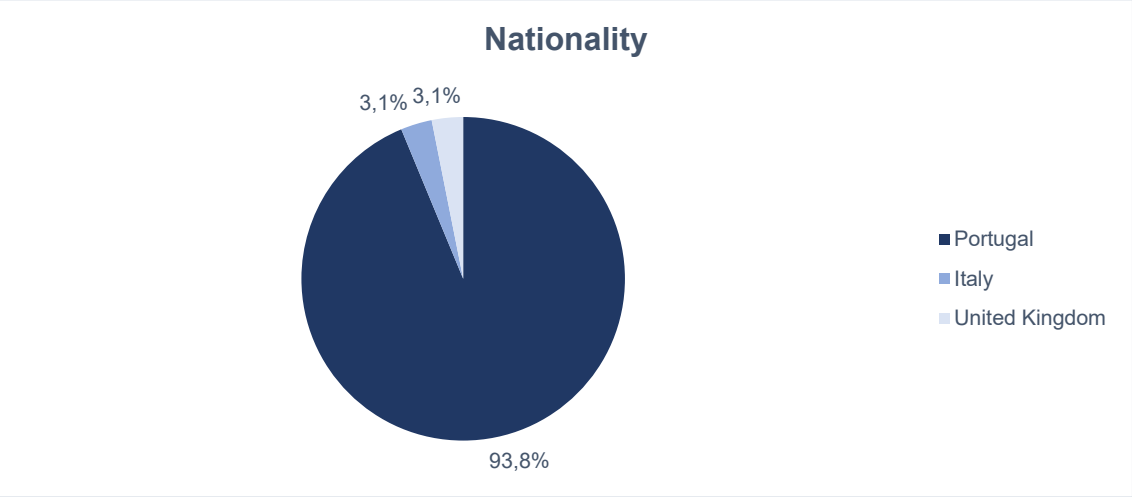



*Figure 6 - Nationality*

In terms of their current place of residence, the majority of the participants reside in Portugal (93.8%), with only one respondent each from Italy and Macau.

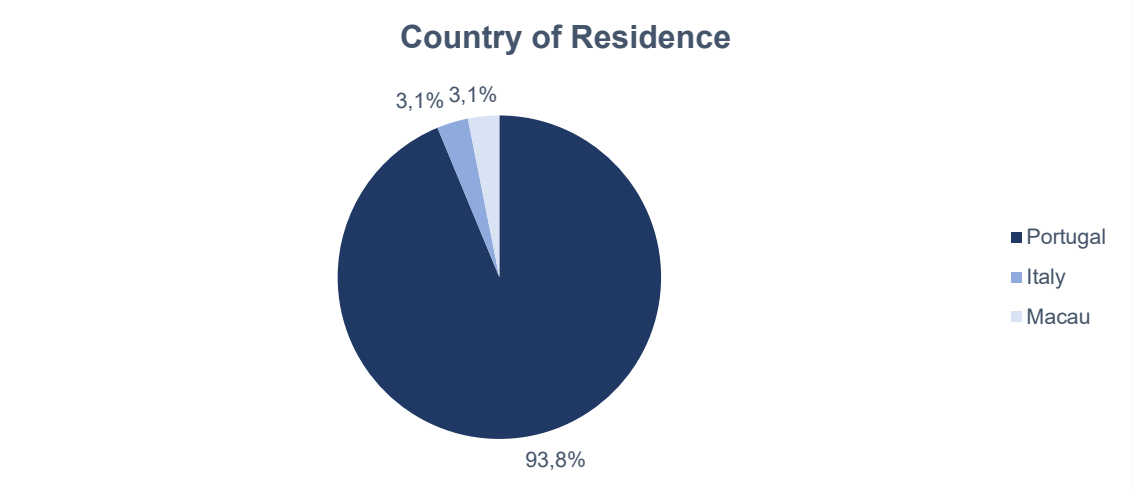



*Figure 7 - Country of residence*

#### *4.1.1.2 Experience as professional translators*

The following question asked was about the experience of the respondents:

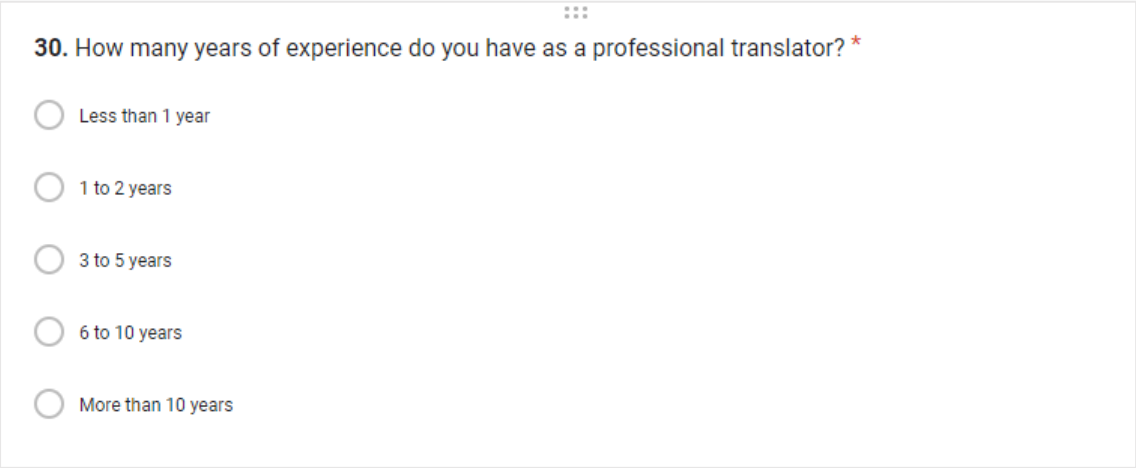



*Figure 8 - Survey question #30*

According to the responses, nearly 60% of the participants in the survey, which corresponds to 19 individuals, boasted over a decade of experience in the field. Four respondents had less than one year of experience and nine others had a translation experience spanning from one to ten years.

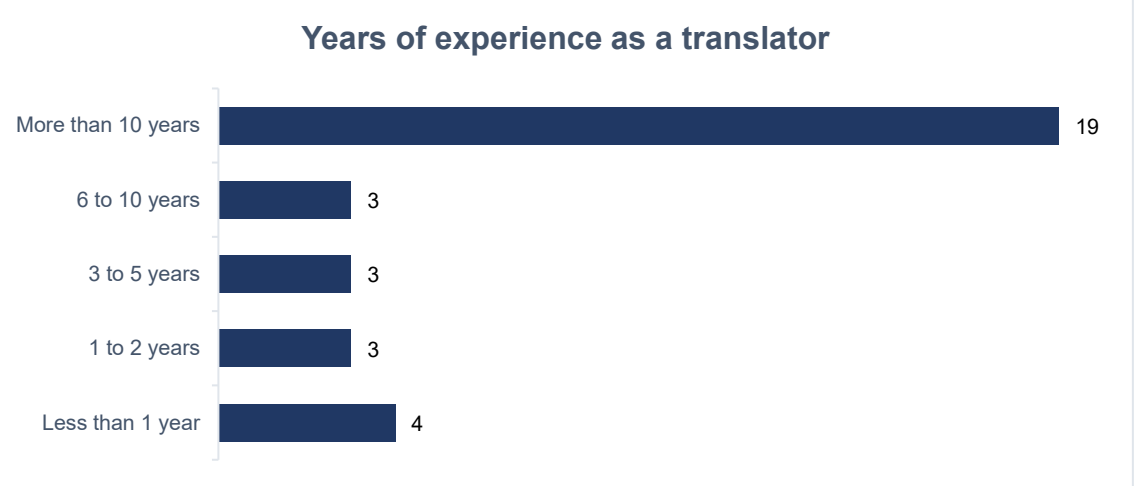



*Figure 9 - Years of experience as a translator*

#### *4.1.1.3 Working languages*

The next question was about the translators' working languages:

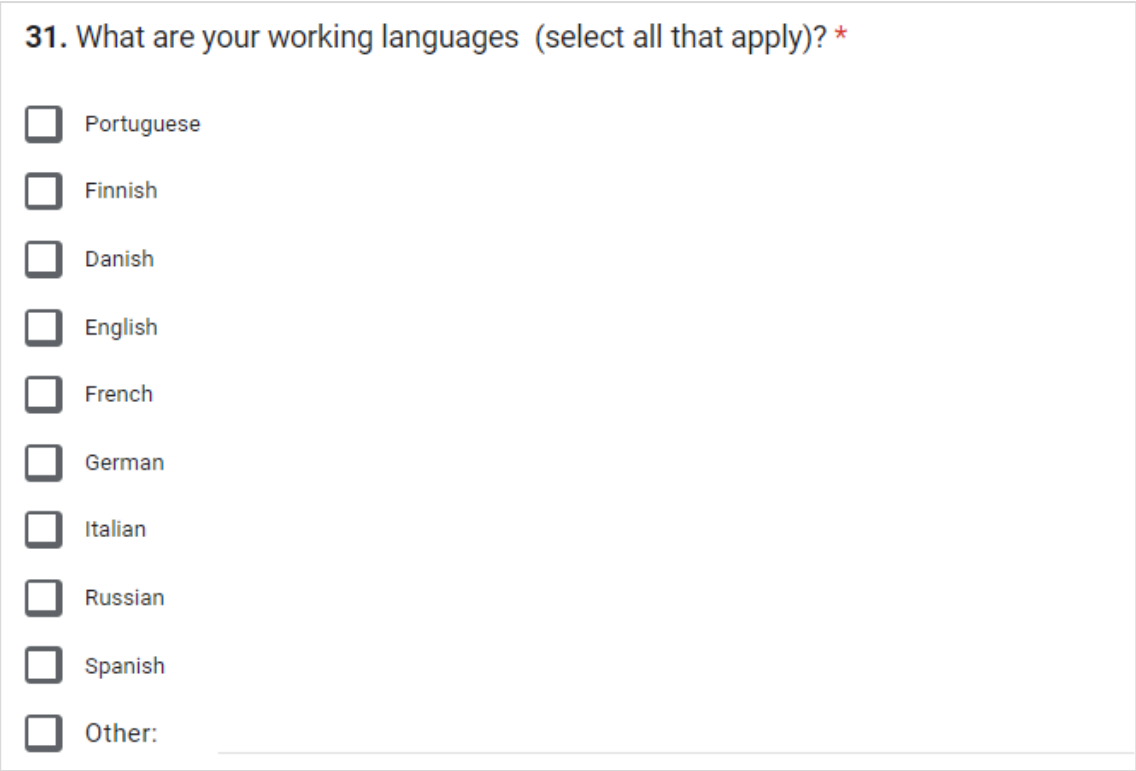



*Figure 10 - Survey question #31*

All 32 respondents in the study met the requirement of having European Portuguese as one of their working languages. Furthermore, every respondent in the survey also worked with English. Spanish and French emerged as two of the next most common working languages among the participants, with 17 translators handling Spanish and 12 dealing with French, accounting for nearly half of the total translators involved in the study.

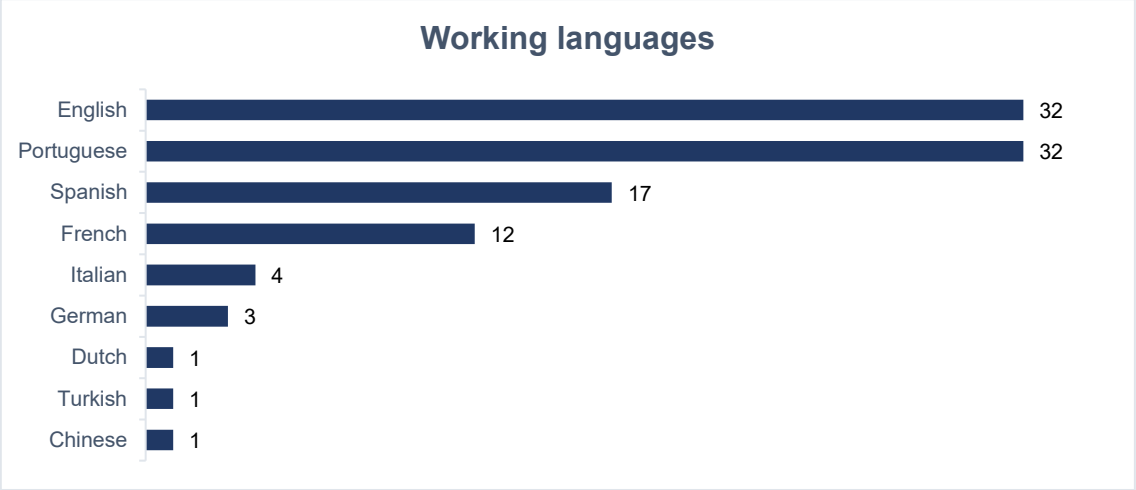



*Figure 11 - Working languages*

#### *4.1.1.4 Type of clients*

Another question was related to the type of clients the respondents served:

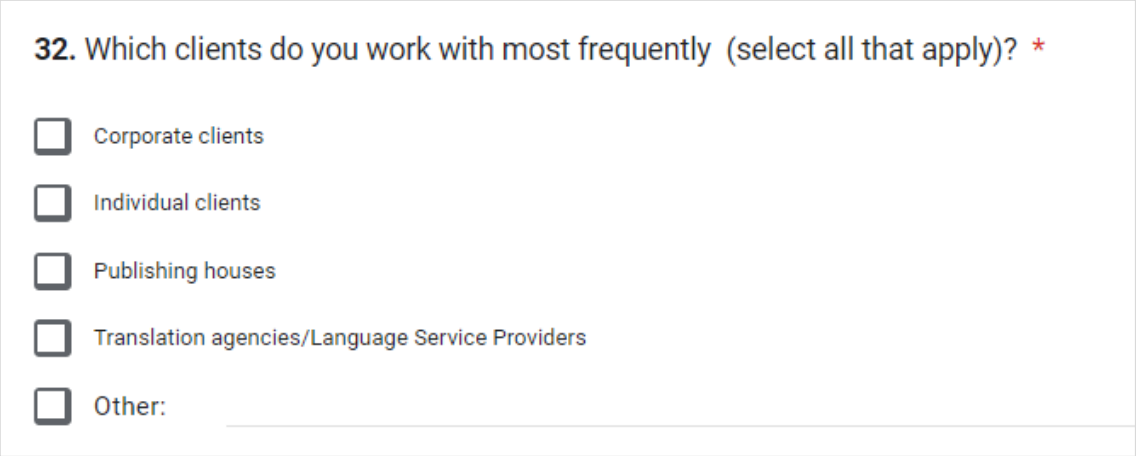



*Figure 12 - Survey question #32*

According to the responses, most worked for LSP/Translation Agencies (59.3%). Both individual and corporate clients' categories were chosen by the same number of respondents (14, corresponding to 43.7%), while a mere five participants (15.6%) worked directly with publishing houses. It is worth mentioning that one respondent was engaged in work for the Macau National Television.


*Figure 13 - Type of clients*

#### *4.1.1.5 Working markets*

We also questioned the respondents about the markets where they conducted their businesses — essentially, the markets where their customers were based:

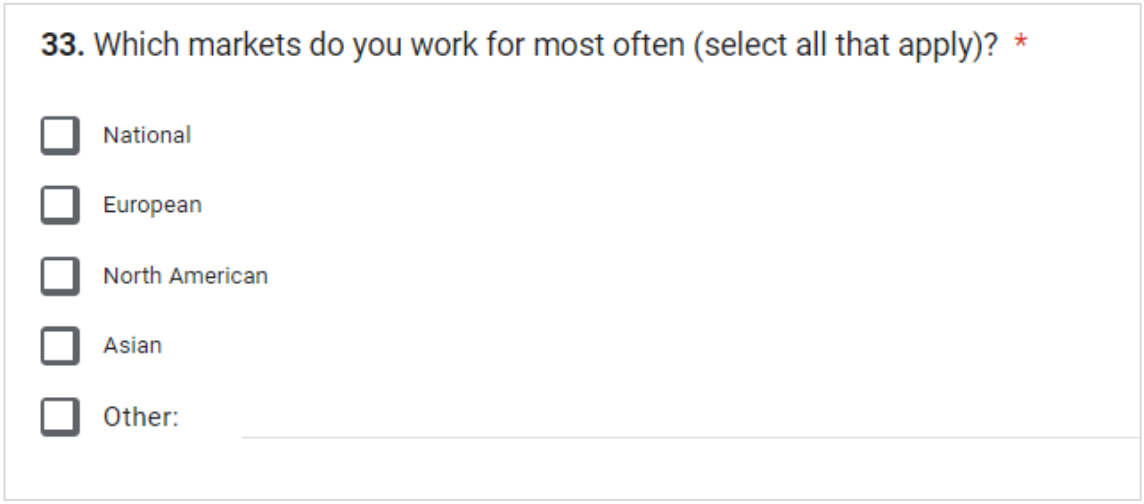



*Figure 14 - Survey question #33*

Most of the respondents (25, corresponding to 78.1%) primarily focused on the domestic market. However, it is worth noting that quite a few of them also engaged in business in various European countries (18, corresponding to 56.3%) and North America (seven, corresponding to 21.9%). Interestingly, the Asian market had the least presence among these translators, with just two of them having clients in that region.

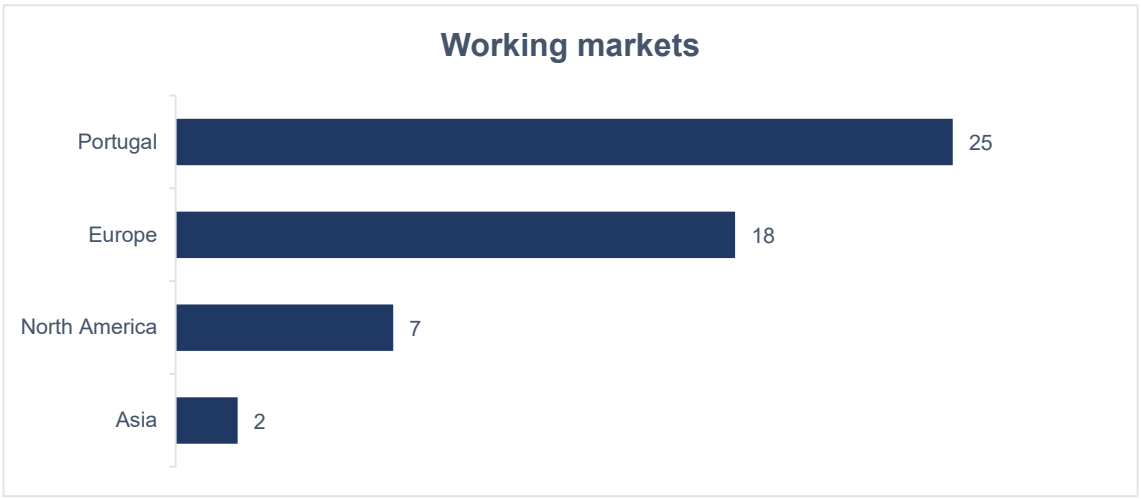



*Figure 15 - Working markets*

#### *4.1.1.6 CAT tools usage*

The final inquiry in this section of the survey referred to the respondents' utilisation of CAT tools which, nowadays, integrate with MT systems increasingly. The objective was to gauge their familiarity with this important technology, as it could potentially be linked to their subsequent utilisation of MT when analysing the survey findings.

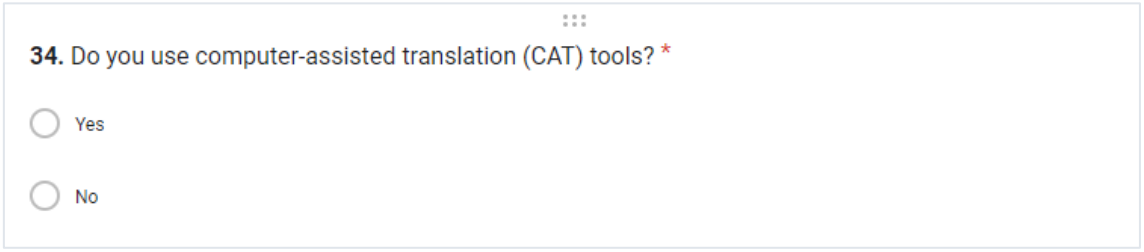



*Figure 16 - Survey question #34*

The collected responses indicated that over 80% of the participants employed these tools. However, it is noteworthy that 19% of them, totalling six respondents, did not utilise CAT tools. Although this number is relevant, the survey data did not provide any clues as to why these respondents did not use these tools.

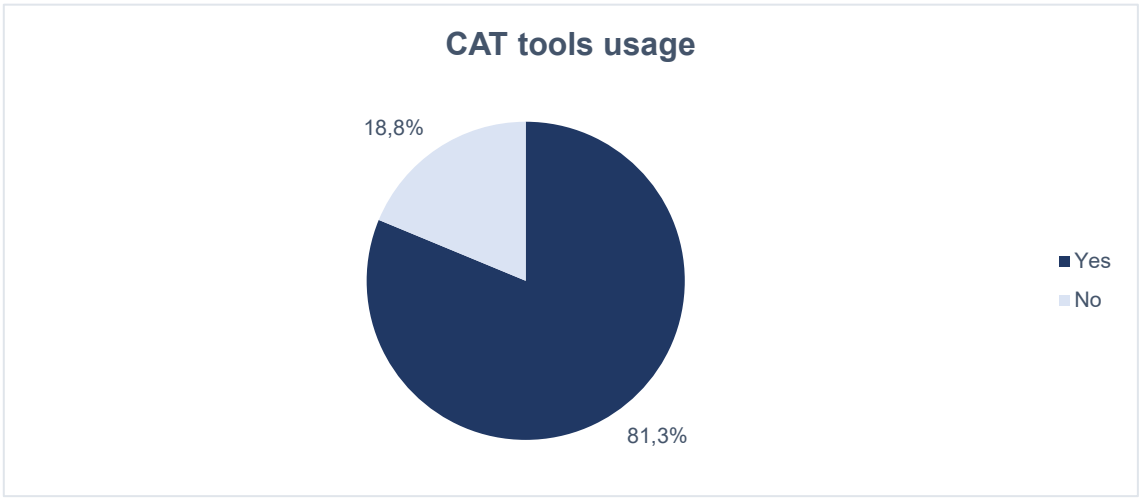



*Figure 17 - CAT tools usage*

#### *4.1.1.7 Key findings on respondents' profile*

To summarise the findings from the first section of the survey:

- The majority of the 32 respondents are Portuguese, residing in Portugal, and primarily work with Portuguese and English as their working languages.
- They are seasoned translators, boasting over 10 years of experience in the field.
- Most of them utilise CAT tools and they primarily collaborate with agencies/LSPs based in Portugal or other European markets.

### 4.1.2 Respondents' knowledge and use of MT

In this part of the survey, our primary objective was to gauge the extent of comprehension professional translators had regarding MT systems. Additionally, we explored whether they utilised these systems and, if they did, how they incorporated them into their work processes.

#### *4.1.2.1 Familiarity with MT*

The initial question revolved around estimating the respondents' familiarity with the technology.

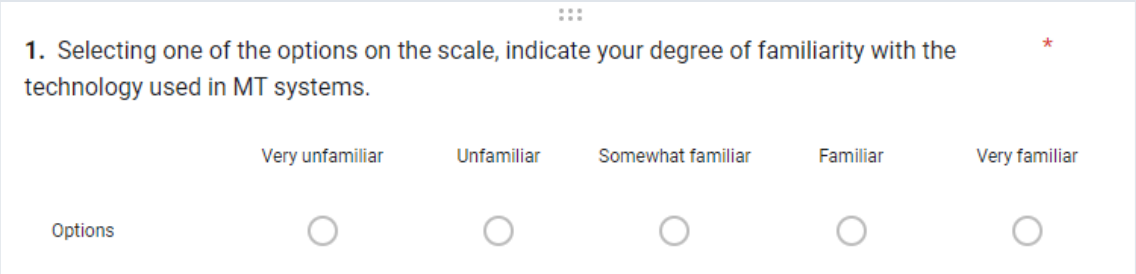



*Figure 18 - Survey question #1*

As highlighted in Figure 19, the majority of respondents indicated having a moderate level of knowledge in this field (46.9%, which corresponds to 15 respondents). Furthermore, there were 10 respondents (31.2%) who claimed to possess a good understanding of the technology, while four respondents (12.5%) confidently stated that they were very familiar with it. Consequently, it is worth noting that only three respondents (a mere 9.4% of the total) reported limited or no knowledge of this technology.

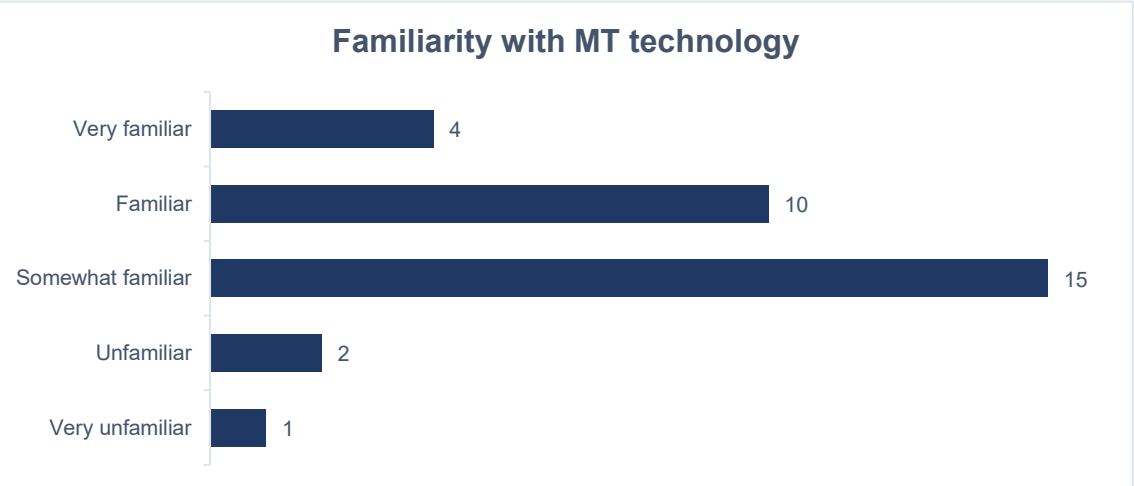



*Figure 19 - Familiarity with MT technology*

#### *4.1.2.2 Sources of MT knowledge*

Additionally, we aimed to determine the primary sources of information that the respondents accessed to in order to become acquainted with MT.

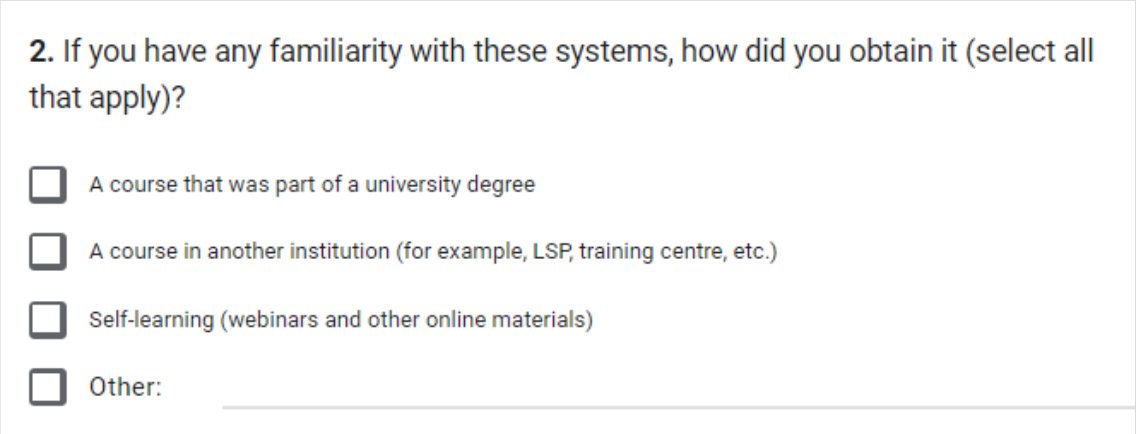



*Figure 20 - Survey question #2*

A substantial majority of the respondents, amounting to 65.6%, reported that they acquired information about MT through self-learning. In contrast, 28.1% of the respondents attended a course as part of their university degree, while an additional 21.9% took a course at a different institution such as an LSP or a training centre. Only one respondent engaged in research work on MT.

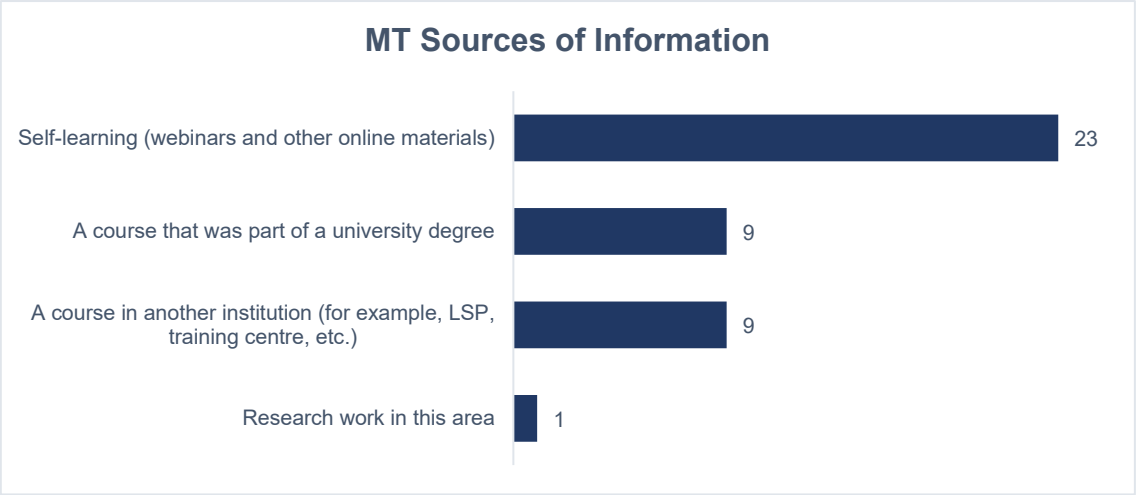



*Figure 21 - MT sources of information*

When we compare these findings with those from the previous question, it becomes clear that respondents who are more familiar with MT have used a variety of information sources to develop their skills and did not rely solely on self-learning.

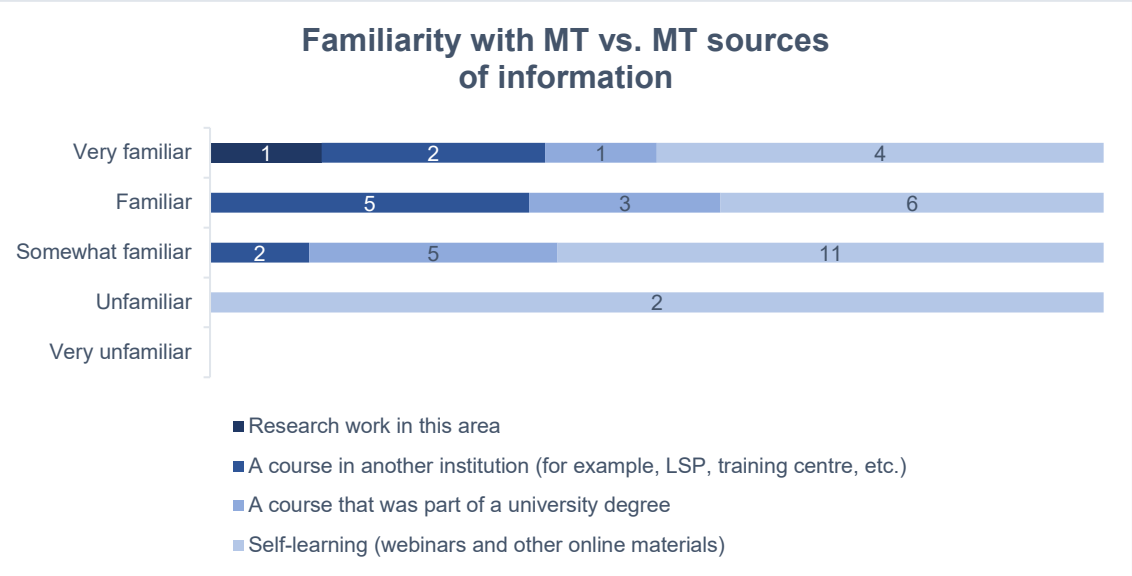



*Figure 22 - Familiarity with MT vs. MT sources of information*

As illustrated in Figure 22 above, self-learning constitutes the sole source of knowledge acquisition for respondents who claim to be unfamiliar with MT. Conversely, it contributes to 61% for those who consider themselves somewhat familiar (11 respondents), 43% for those who are familiar (6 respondents), and 50% for those who claim to be very familiar (4 respondents).

#### *4.1.2.3 MT usage*

For the following question, our aim was to determine the number of respondents who utilised MT, regardless of their level of understanding about the technology. Based on their response to this question, the respondents would proceed to the subsequent questions in this section, which pertain to their usage of the technology. Otherwise, they would be directed to question #14, related to ChatGPT.

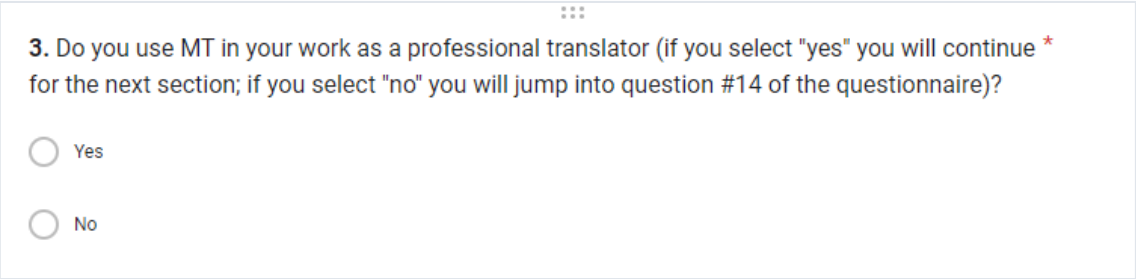



*Figure 23 - Survey question #3*

The answers revealed that a large majority of the respondents, specifically 24 individuals, constituting 75% of the total respondents, used MT in their work, while 25% of respondents stated that they did not use it. These results align with Cadwell *et al.* (2017, p. 309), although their reported percentages are slightly higher. In their survey, 82% of respondents stated they used MT at least a few times per month, while only 18% said they used it only a few times per year or never. This is particularly interesting considering that Cadwell *et al.*'s survey was conducted in 2016 and 2017, six years before the present survey, when MT was considerably less developed than it is now. There are also similarities with the results presented by Farrell (2022, p. 3). In his survey, 70% of the translators reported using MT in their work. Likewise, the results are consistent with the respondents' stated familiarity with MT in survey question #1, as described earlier. Specifically, 29 respondents indicated they had at least some familiarity with MT systems, and of those, only five said they did not use MT in their translation work.

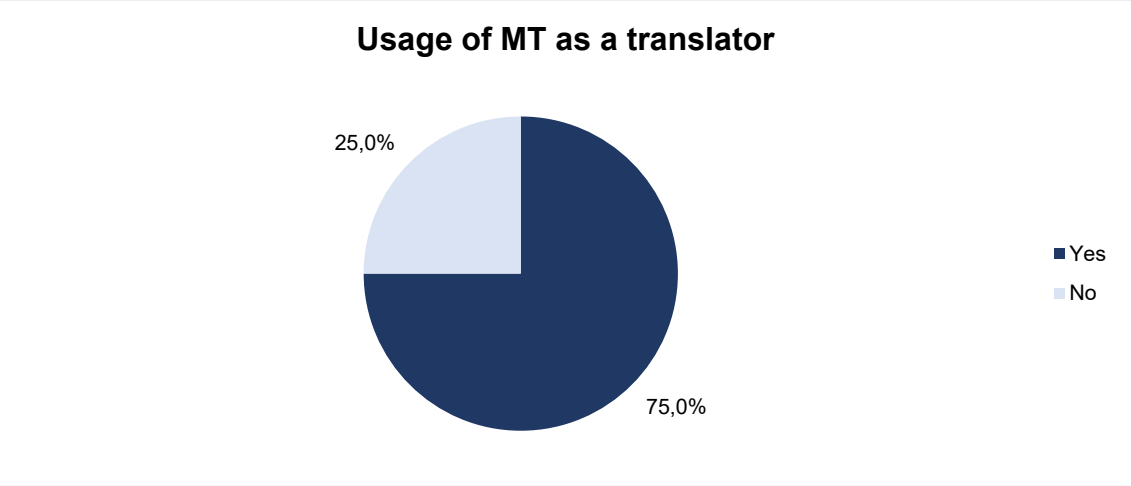



*Figure 24 - Usage of MT as a translator*

When examining this information in connection with the data on the use of CAT tools, it became evident that there was a direct link between the users of CAT tools and those who used MT. The chart in Figure 25 illustrates that out of the 26 CAT tools users, only four, which is about 15% of the total, did not utilise MT. In contrast, among the respondents who did not use CAT tools, the majority also did not employ MT (four respondents), although there were two respondents who mentioned using it in spite of not using CAT tools.

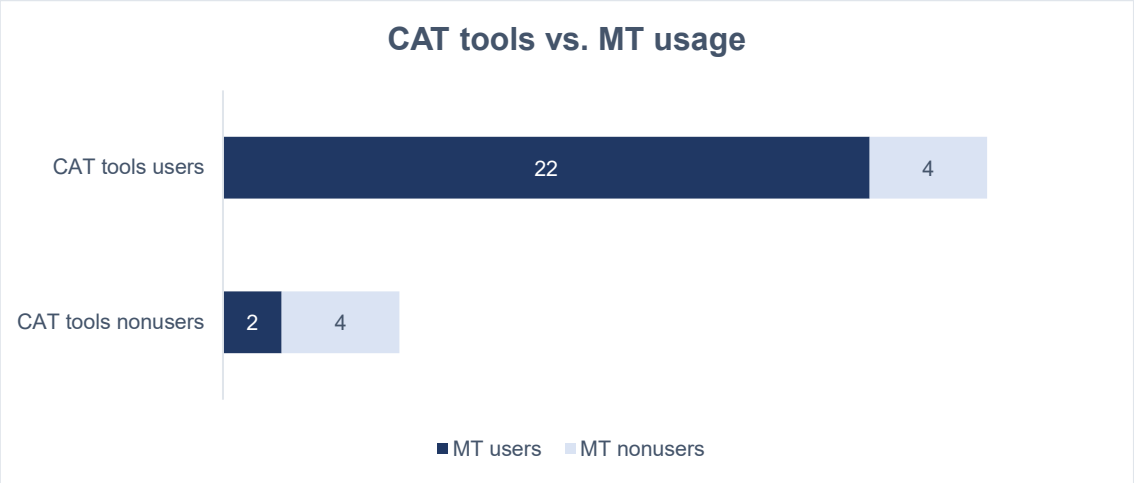



*Figure 25 - CAT tools vs. MT usage*

Comparing this data with the respondents' years of professional experience, we observed that there was no clear connection between the years of experience and the adoption of MT. Across all the different ranges of years, a majority of the respondents used MT, except for the six to ten-year range, as indicated in Figure 26 below. This result is also in line with Farrell (2022, p. 4), who reports that, according to the data he collected, there is no noticeable difference in the use of MT when compared to the years of experience as translators.

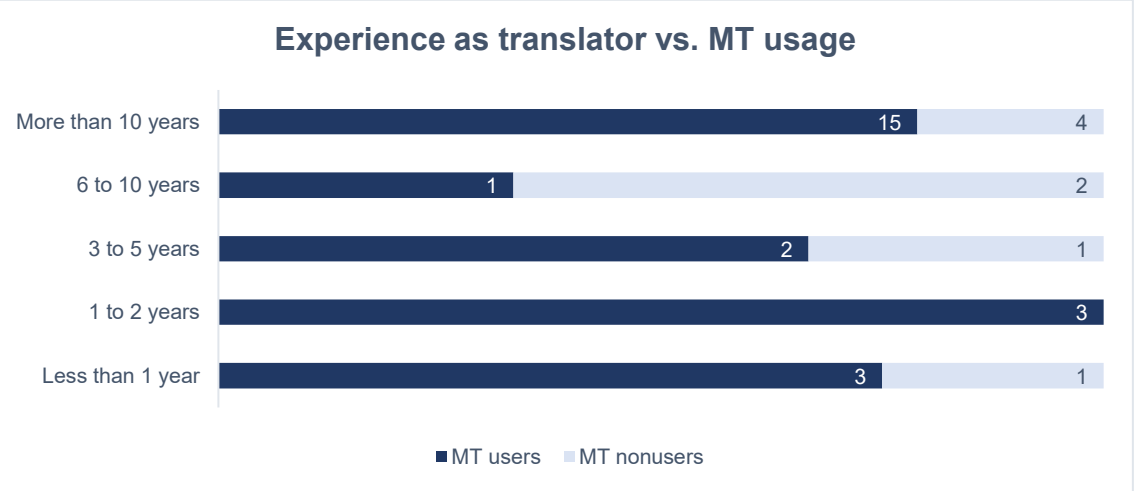



*Figure 26 - Experience as translator vs. MT usage*

#### *4.1.2.4 Years of MT usage*

Subsequently, we inquired about the duration for which these 24 respondents had been using MT:

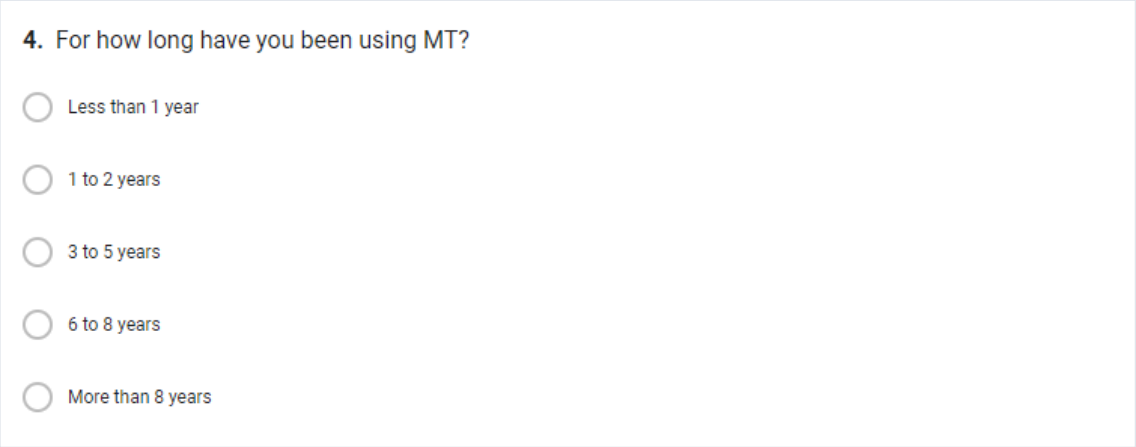



*Figure 27 - Survey question #4*

The majority, comprising 41.7% (10 respondents), reported using MT for one to two years, followed by eight respondents (33.3%) using MT for three to five years. Three respondents (12.5%) indicated usage ranging from six to eight years, while two respondents (8.3%) reported using it for over eight years. Only one respondent (4.2%) mentioned using it for less than one year.

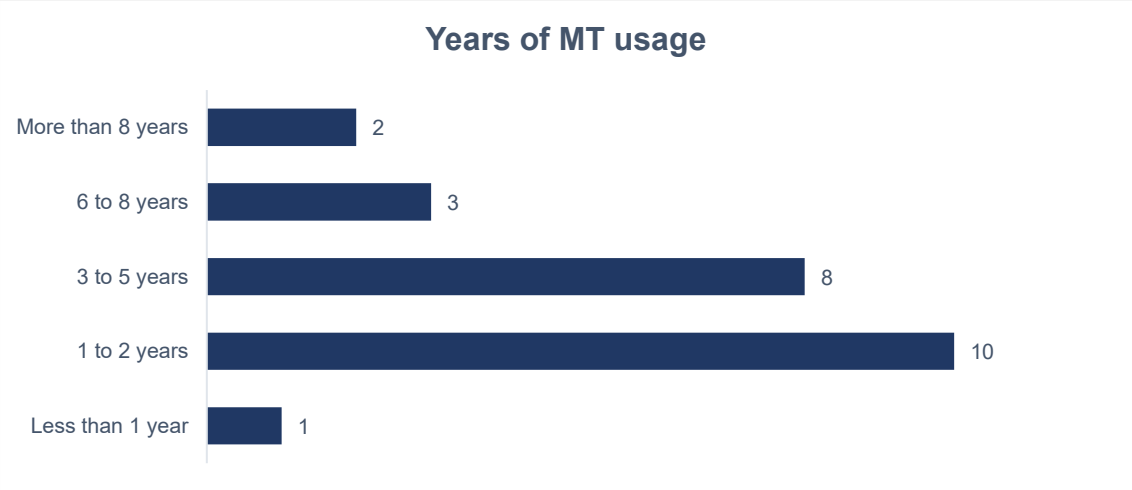



*Figure 28 - Years of MT usage*

#### *4.1.2.5 MT models used*

Regarding the models utilised, our aim was to determine the respondents' awareness of this topic. Hence, we posed the following question:

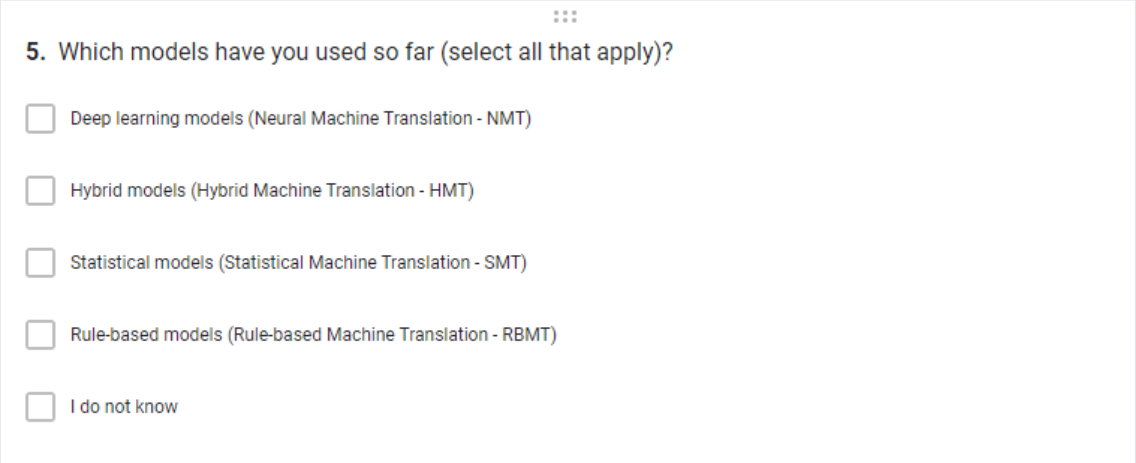



*Figure 29 - Survey question #5*

The results, as we anticipated, revealed that most of the respondents either currently worked with or had prior experience with NMT systems. Specifically, 17 respondents, which represent more than 70% of the total MT users, fell into this category. Interestingly, there were seven users (about 29%) who seemed uncertain about the specific systems they had used. This might be partially explained by the fact that six out of these seven respondents reported acquiring knowledge about MT through self-learning. This suggests a more practical approach to learning, without theoretical information about the various existing MT models. HMT, SMT and Rule-Based MT were comparatively less used among the respondents. The data showed that five individuals had used HMT, three had used SMT, and another three had employed Rule-Based MT, as depicted in Figure 30 below.

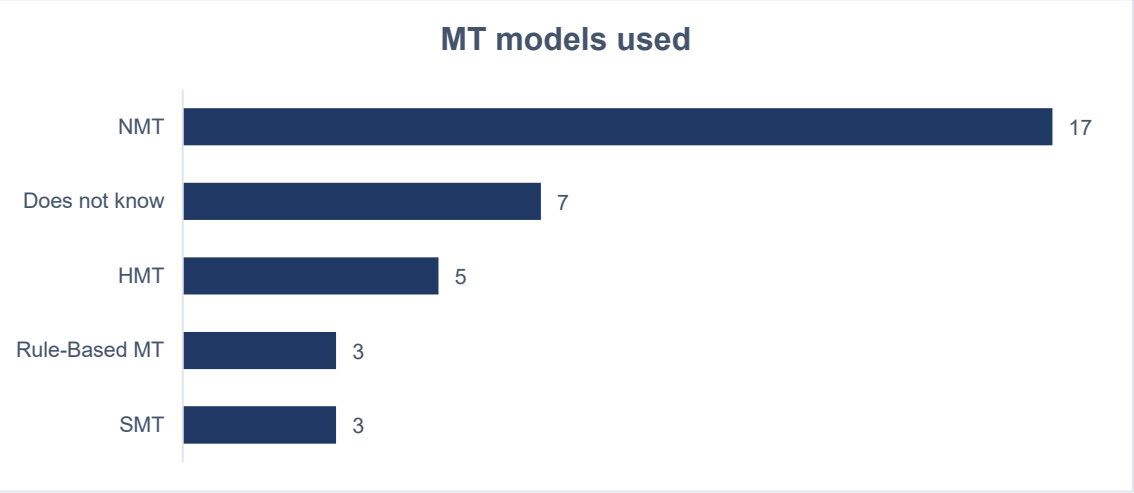



*Figure 30 - MT models used*

In accordance with this, when examining the models used in connection with the years of MT usage, the data indicated that respondents who had a longer history of using MT tended to have experience with a wider array of systems. Conversely, newer users either lacked awareness of the systems they had employed so far or exclusively utilised NMT, the latest technology in this field. This is totally justified by the fact that HMT, SMT and Rule-Based MT have not been available once NMT came along.

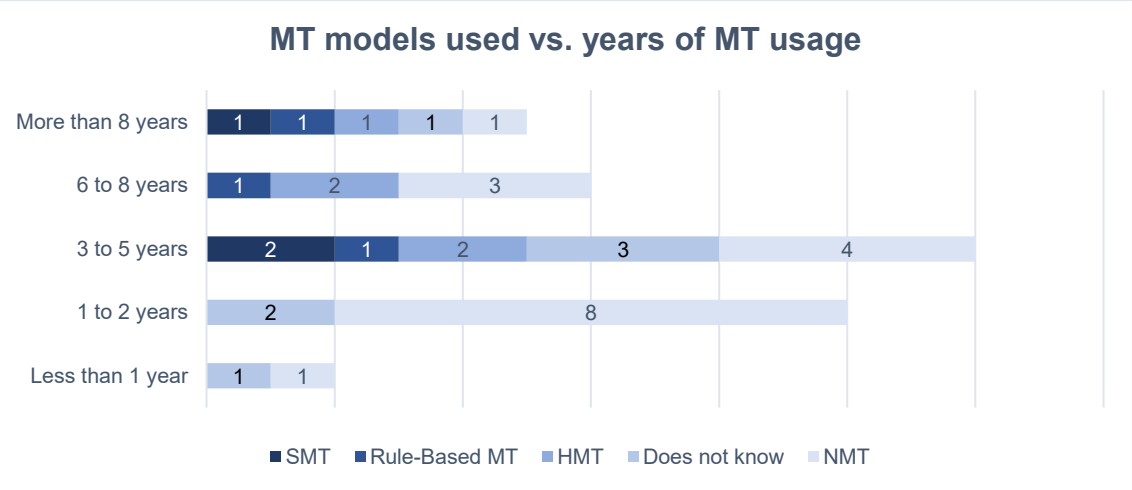



*Figure 31 - MT models used vs. years of MT usage*

#### *4.1.2.6 Type of MT systems used*

Moving forward, we posed a subsequent query regarding the type of systems the respondents used:

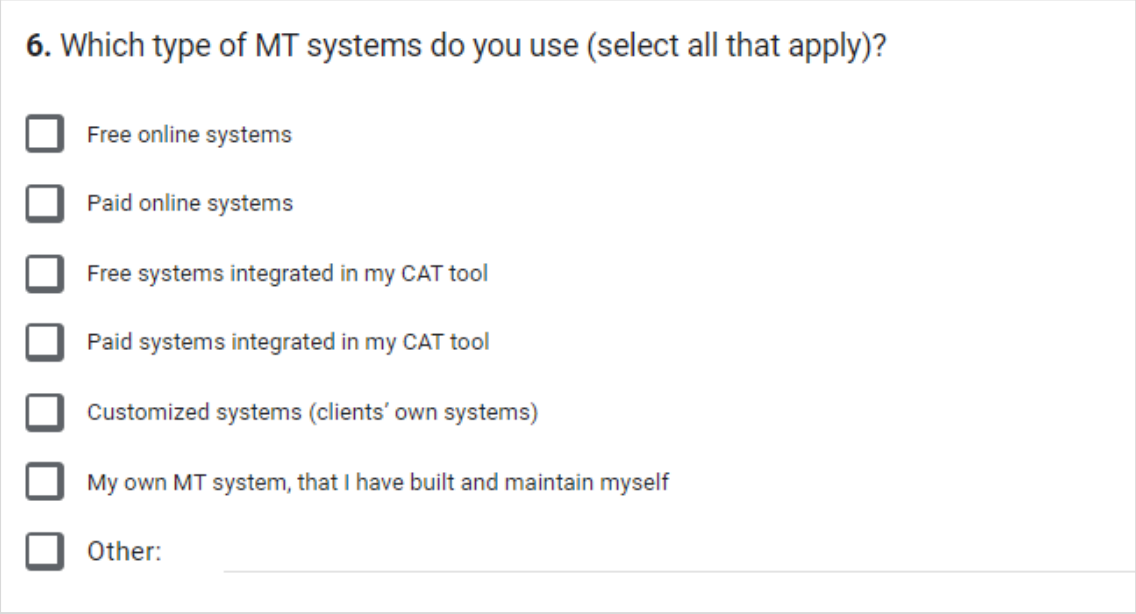



*Figure 32 - Survey question #6*

A sizable portion of the respondents, approximately 67% of the total MT users, made use of free online systems, which is quite surprising, given the security issues these types of systems pose. Moreover, a substantial percentage, about 45.8% corresponding to 11 respondents, accessed free systems integrated into their CAT tools, while an additional 37.5% (equating to 9 respondents) utilised customised systems belonging to their clients. Among the 24 MT users in total, half of the respondents also stated that they paid to access MT systems. Specifically, four respondents utilised online paid systems, while eight others accessed paid systems integrated within their CAT tools. Interestingly, one of the respondents had constructed and maintained their own system.

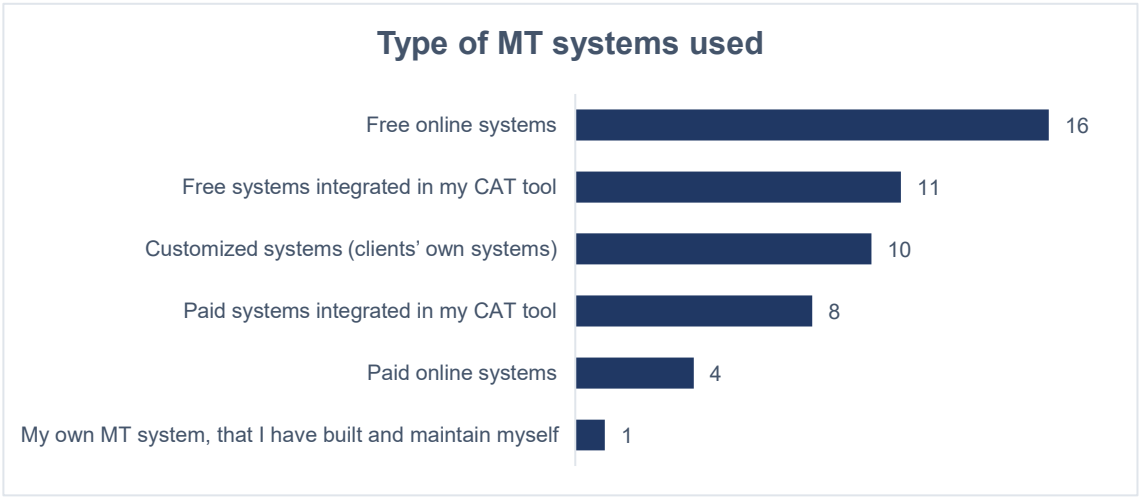



*Figure 33 - Type of MT systems used*

#### *4.1.2.7 Translators' areas of specialisation and MT usage*

Afterward, we aimed to determine the specific fields in which the respondents worked as translators and the particular areas within these fields where they utilised MT. To accomplish this, we presented them with the following question:

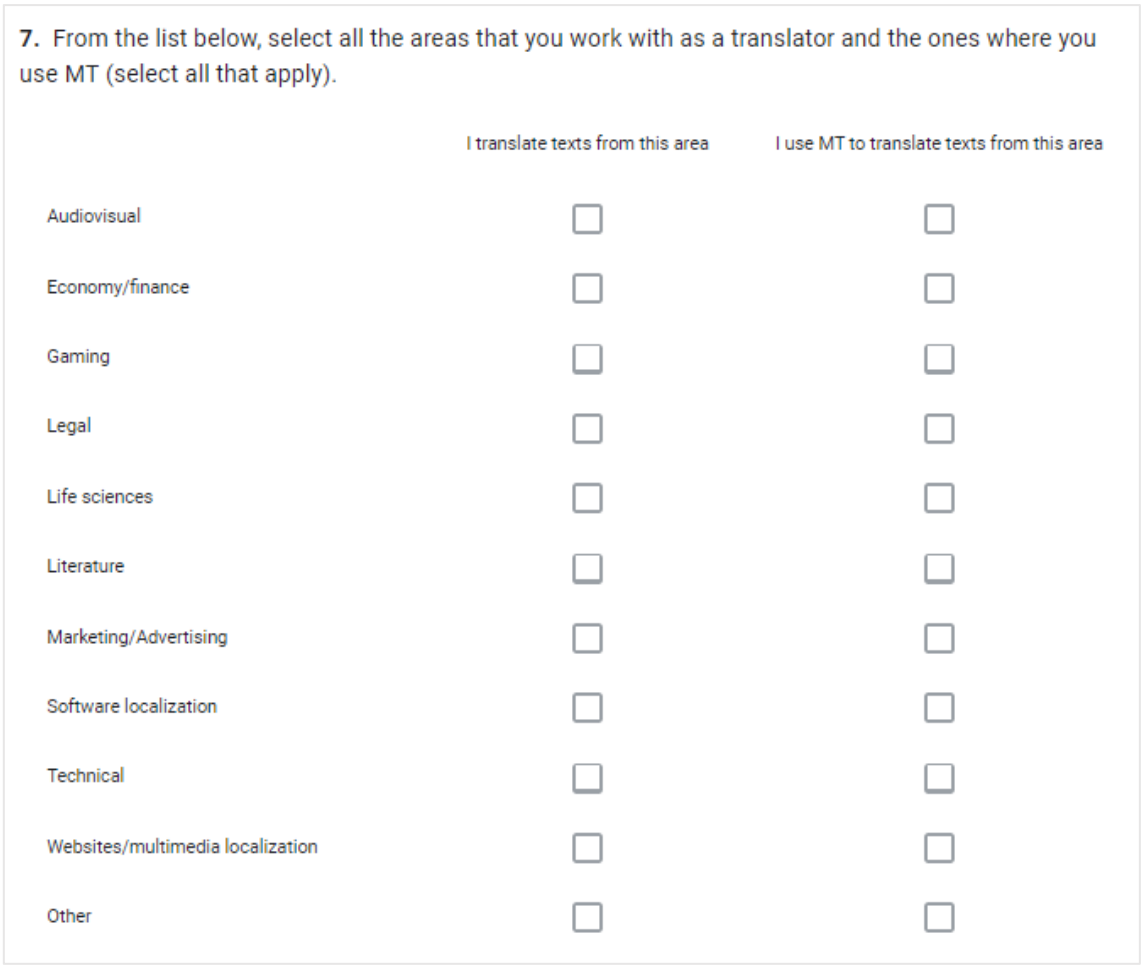



*Figure 34 - Survey question #7*

As can be seen in Figure 35 below, the survey data indicated that the bulk of the participating translators specialised in technical translation, with 16 respondents in this category. Among these, 56.3% incorporated MT into their workflow. However, when looking at the translators working in the area of Websites/Multimedia Localisation, it can be observed that out of the 11 respondents, over 70% utilised MT. Furthermore, when examining those working in the realm of Life Sciences, four out of the five respondents, which accounts for 80%, integrated MT into their translation practices. On the flip side, in the domain of Literature, only three out of the nine respondents, equivalent to 33.3%, relied on MT for their translation work, which is understandable given their well-known resistance to translation technologies, as mentioned by Way *et al.* (2023, p. 97)

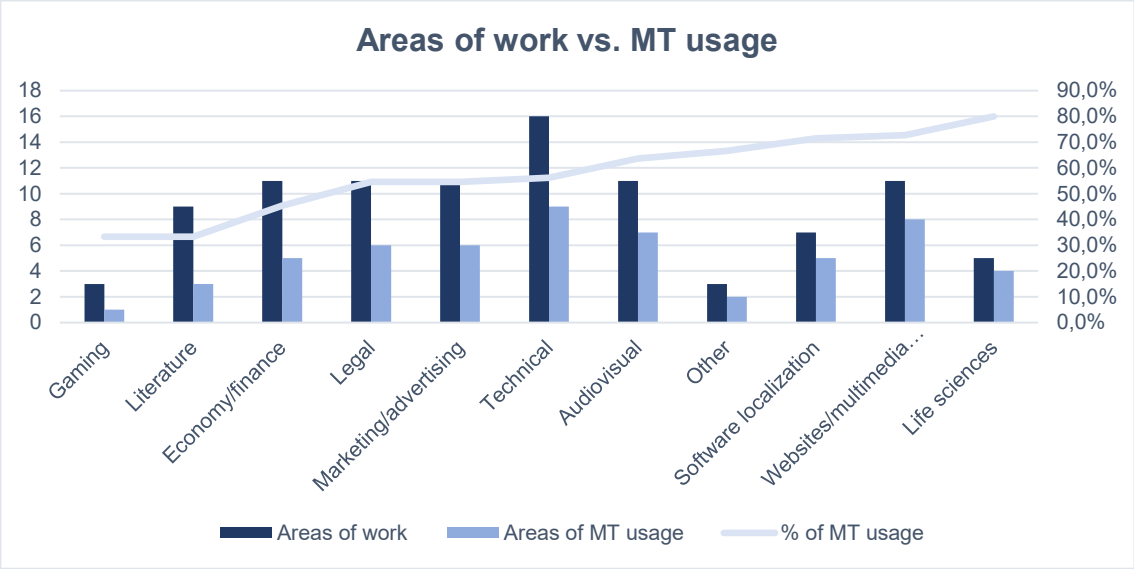



*Figure 35 - Areas of work vs. MT usage*

#### *4.1.2.8 Motivations for MT usage*

With the next question, we were interested in understanding the motivations behind the respondents' use of MT:

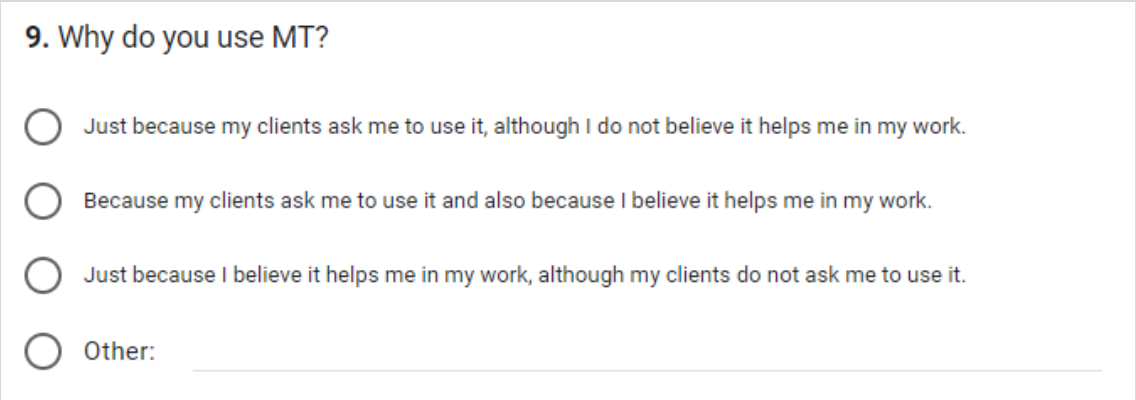



*Figure 36 - Survey question #9*

Upon analysing the received data, we examined the reasons cited for utilising MT alongside the respondents' years of professional practice. The findings indicated that the majority of the respondents (17 translators, making up 71% of the total) highlighted that they incorporated MT because they believed it was beneficial for their work. This rationale was consistently observed across all levels of professional experience. Additionally, seven of these respondents also mentioned that they integrated MT into their workflow due to client requests. Notably, within the group of 24 respondents, only four specified that their use of MT solely stemmed from client demands, despite their personal belief that this technology does not contribute significantly to their work. These particular respondents have more than 10 years of professional experience.

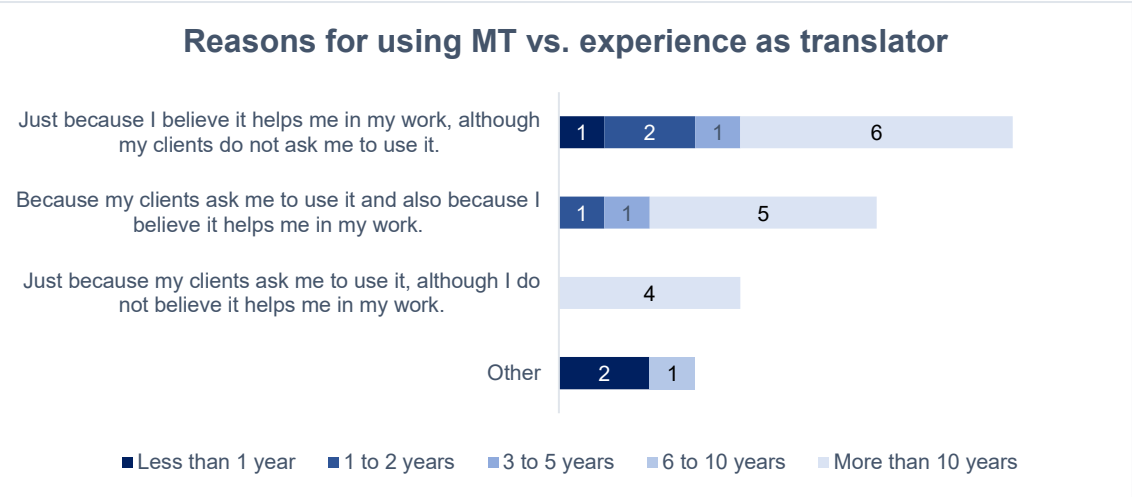



*Figure 37 - Reasons for using MT vs. years of experience*

Lastly, it is pertinent to mention that three respondents (one with 6 to 10 years of experience and two with less than one year of experience) indicated alternative motives for utilising MT, namely[8]:

- Translator with 6 to 10 years of experience in the profession : “Only to write less. I do not offer MTPE services, and I do not advise them.”
- Translator with less than one year of experience in the profession: “It depends on the cases. I do not use it always but when the source text is clearly an MT output, I use it to try to better understand what the meaning of the original text is or to try to have a better understanding of the sentences.”
- Translator with less than one year of experience in the profession: “I use MT sporadically and only to compare the outputs with my own translation, which is sometimes useful to detect parts of the source text that I have missed in my translation.”

#### *4.1.2.9 Clients’ awareness of translators’ usage of MT*

Another important aspect to ascertain how translators use MT was to know whether or not they informed their clients about it. For this purpose, the question posed was the following:

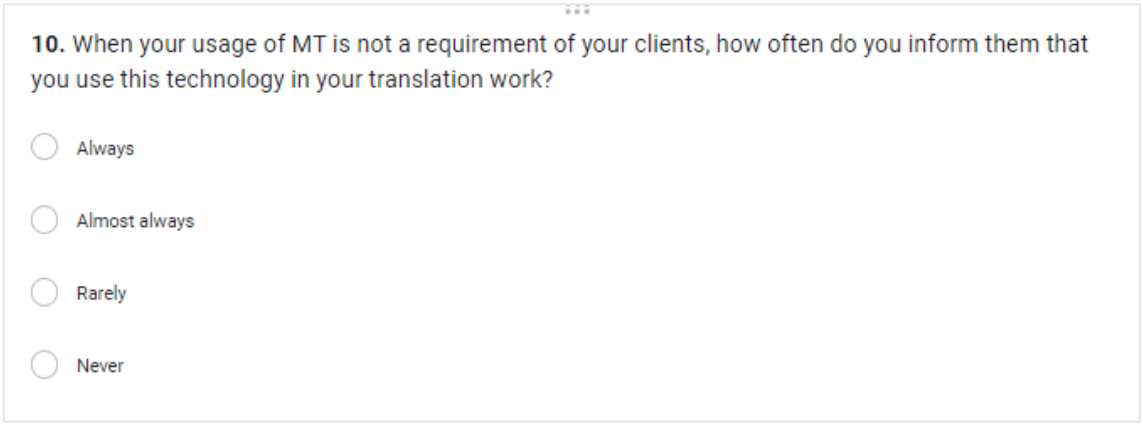



*Figure 38 - Survey question #10*

[8] All the answers transcribed were translated by the author. The answers were originally given in Portuguese.

The majority of the respondents stated that they never or rarely informed their clients about their usage of MT in translations (40.9% and 27.3% respectively, corresponding to a total of 15 respondents), whereas only 13.6% (corresponding to 3 respondents) always informed their clients that they were using MT. This fact is also observed in Farrell (2022) study where 67% of the respondents declared they consider their clients do not necessarily need to be informed about their use of MT. A slightly different perspective is offered by the survey held by Pérez Macías (2020, p. 27). In this case, when asked if they thought it was necessary to inform the client if they used PE on their own in a project, only 28% of the respondents answered "no, under no circumstances" and 34% answered "no, if it does not form the basis of the final delivery".

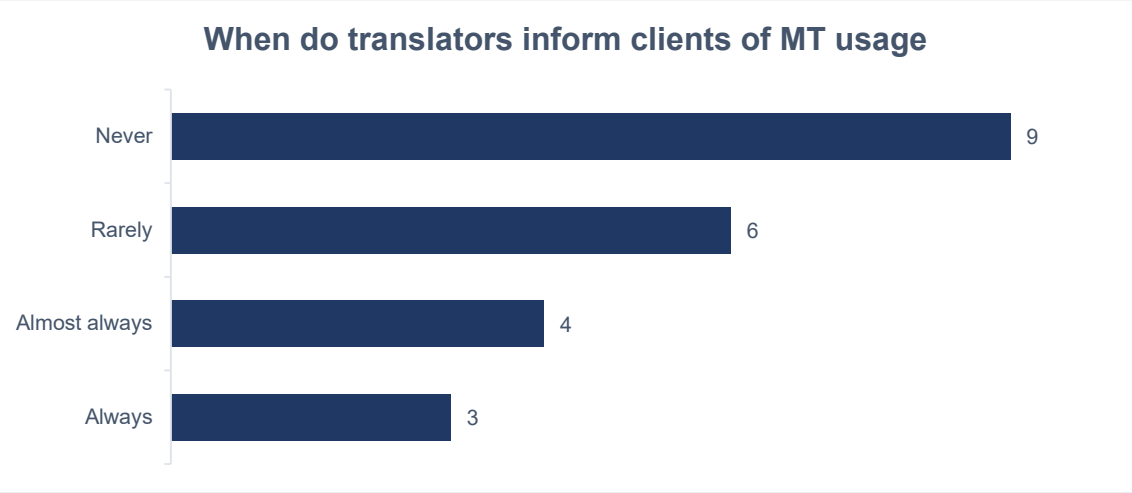



*Figure 39 - When do translators inform clients of MT usage*

#### *4.1.2.10 Contribution for the creation or improvement of MT systems*

The last three questions of this section of the survey were related to the awareness of translators about their contribution to the creation or improvement of an MT system. The questions were as follows:

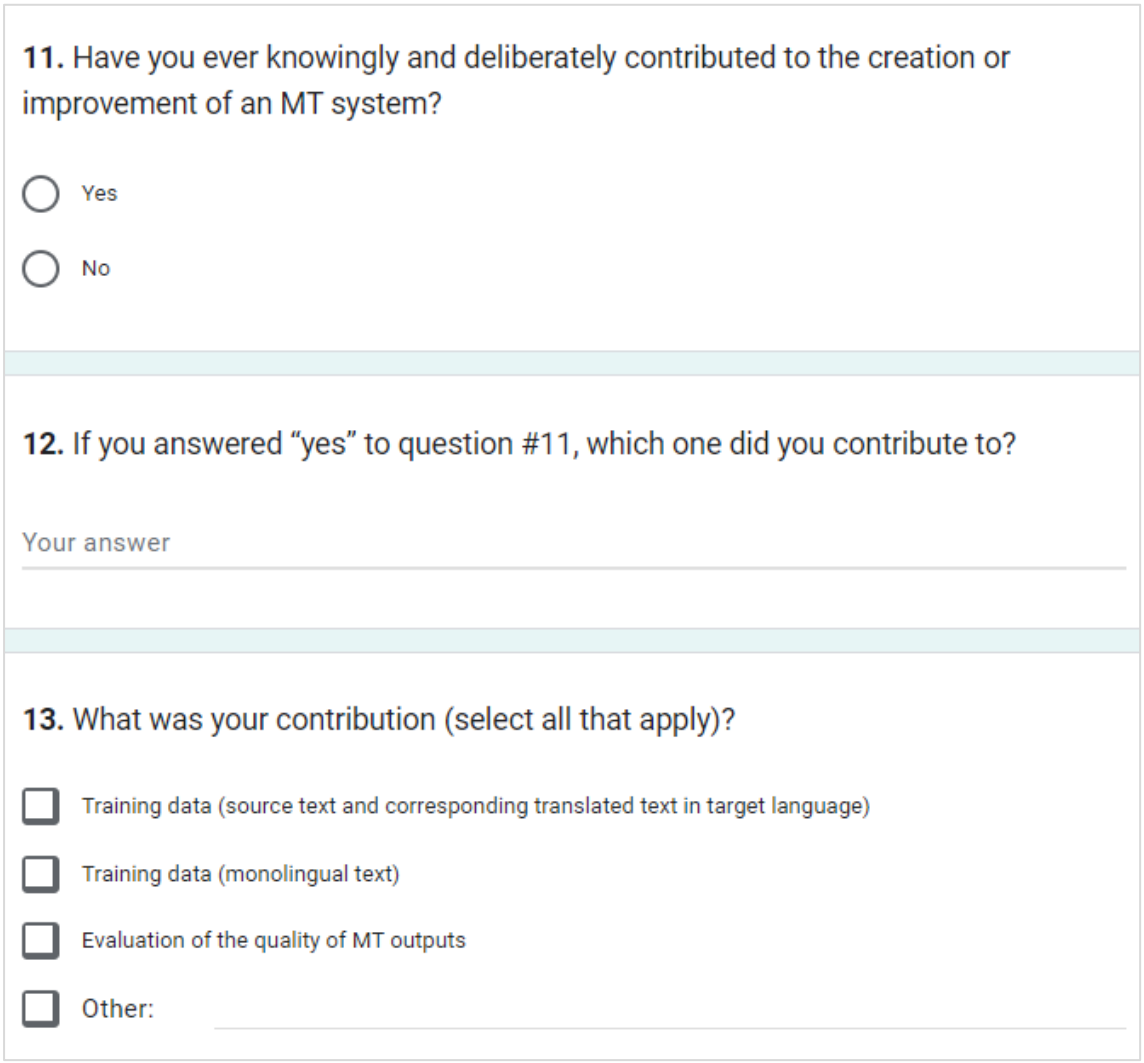



*Figure 40 - Survey questions #11, 12 and 13*

The responses were summarised in the graphic shown in Figure 41 below. Out of the 24 respondents who used MT in their work, 15, corresponding to 62.5%, stated that they had never contributed to the creation or improvement of an MT system. Among the remaining nine respondents, three claimed to have aided Google Translate by providing training data and assessing the quality of its MT results. Five stated that they did not know which system they had contributed to, although they were aware it involved providing training data and evaluating MT output quality. Lastly, one respondent could not disclose the systems they contributed to, although it is mentioned that it was related to training data.

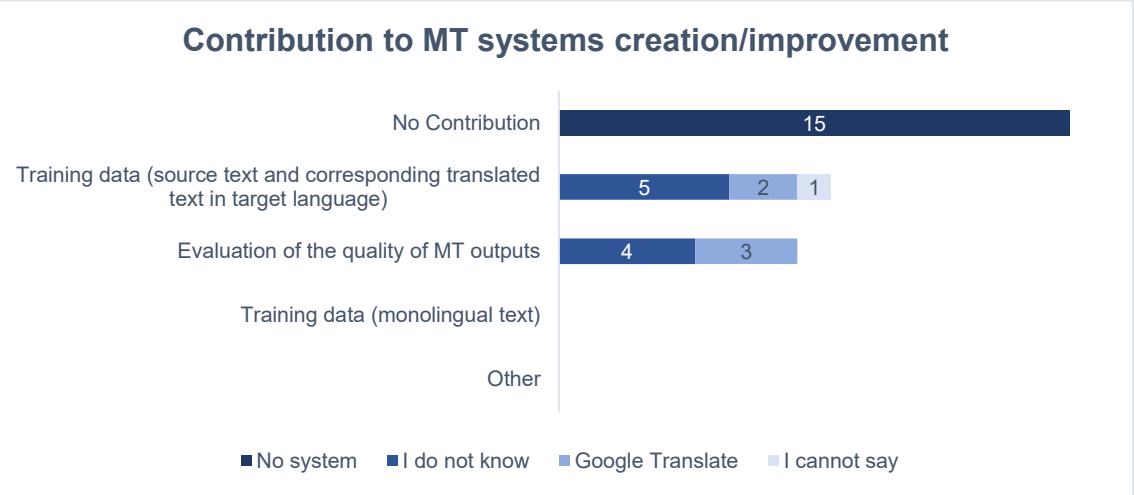



*Figure 41 - Contribution for MT systems creation/improvement*

#### *4.1.2.11 Key findings on respondents' knowledge and use of MT*

Below are the main points reported by the respondents in this section of the survey:

- Familiarity with MT primarily stems from self-learning, with most of the respondents claiming to be at least somewhat familiar.
- Those with deeper knowledge also acquired it through self-learning but typically report additional structured learning experiences in universities or other institutions.
- Most respondents use MT in their work. Nevertheless, the percentage is slightly lower than that for the usage of CAT tools. This includes translators with varying levels of experience, from less than one year to over 10 years.
- The majority started using MT one or two years ago, predominantly employing NMT models. These are mostly free online systems or systems integrated in CAT tools. Only those with more years of MT usage report having used other models like SMT, HMT, or Rule-Based MT.
- MT is primarily used for technical translations, websites/multimedia localisation, or life sciences translations, with literary translators having the lowest usage rate.

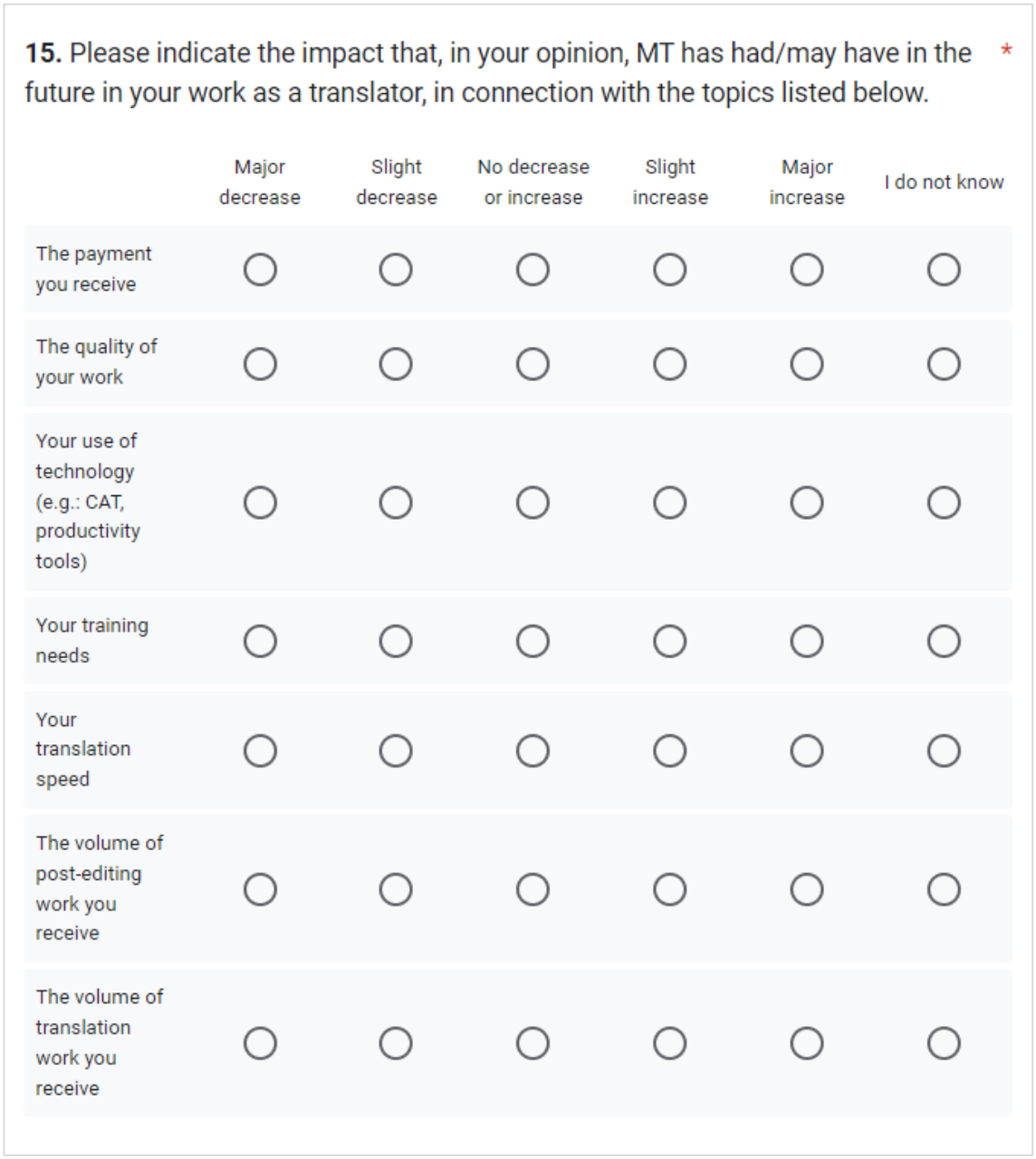
- Interestingly, the motivation for MT usage is mainly driven by the belief that it aids the respondents in their work, rather than being mandated by clients. Moreover, respondents rarely or never disclose their use of MT to their clients.
- Lastly, when asked about contributing to the creation or improvement of any MT system, the majority stated they have never contributed, although some mentioned contributing bilingual training data or evaluating MT outputs' quality, mainly for Google Translate or for non-identified systems.

### 4.1.3 The impact of MT in the respondents' work

This survey segment aimed to determine the influence of MT in the work of translators and how they perceived or anticipated its impact in the future.

#### *4.1.3.1 Perceived impact of MT in translators' work*

The respondents were presented with a list of topics and a corresponding Likert scale:



**15.** Please indicate the impact that, in your opinion, MT has had/may have in the future in your work as a translator, in connection with the topics listed below. *

| | Major decrease | Slight decrease | No decrease or increase | Slight increase | Major increase | I do not know |
|---|---|---|---|---|---|---|
| The payment you receive | ○ | ○ | ○ | ○ | ○ | ○ |
| The quality of your work | ○ | ○ | ○ | ○ | ○ | ○ |
| Your use of technology (e.g.: CAT, productivity tools) | ○ | ○ | ○ | ○ | ○ | ○ |
| Your training needs | ○ | ○ | ○ | ○ | ○ | ○ |
| Your translation speed | ○ | ○ | ○ | ○ | ○ | ○ |
| The volume of post-editing work you receive | ○ | ○ | ○ | ○ | ○ | ○ |
| The volume of translation work you receive | ○ | ○ | ○ | ○ | ○ | ○ |

*Figure 42 - Survey question #15*

As depicted in Figure 43 below, two topics stood out as having a potential decrease, either slight or major, attributed to MT. According to the survey responses, these referred to the payment received by translators and to the volume of translation work. Regarding

the payment received, although the majority of respondents (43.8%) believed there have been no changes in this aspect of their profession and do not expect any in the future, a substantial 40.6% of respondents anticipated a slight or major decrease and only 9.4% considered there has been or will be a slight increase in the payments they receive. As for the volume of translation work, the responses indicated that 43.8% of the translators considered there has been or will be a major or slight decrease. In opposition, 28.1% asserted that there has been no decrease or increase and do not expect any in the future, and 25% expressed the belief that translation work has slightly or significantly increase or will in the future.

| Impact that MT has had/may have in the future in respondents' work as translators | | | | | | |
|---|---|---|---|---|---|---|
| **Topics** | **Major decrease** | **Slight decrease** | **No decrease / increase** | **Slight increase** | **Major increase** | **I do not know** |
| **The payment you receive** | 28.1% | 12.5% | 43.8% | 9.4% | 0.0% | 6.3% |
| **The quality of your work** | 6.3% | 15.6% | 40.6% | 25.0% | 9.4% | 3.1% |
| **Your use of technology (e.g.: CAT, productivity tools)** | 0.0% | 3.1% | 31.3% | 25.0% | 34.4% | 6.3% |
| **Your training needs** | 3.1% | 0.0% | 46.9% | 18.8% | 18.8% | 12.5% |
| **Your translation speed** | 0.0% | 6.3% | 21.9% | 34.4% | 34.4% | 3.1% |
| **The volume of post-editing work you receive** | 3.1% | 0.0% | 21.9% | 28.1% | 40.6% | 6.3% |
| **The volume of translation work you receive** | 21.9% | 21.9% | 28.1% | 15.6% | 9.4% | 3.1% |

*Figure 43 - Responses to survey question #15*

Conversely, three topics emerged where a majority of respondents anticipated a slight or significant increase attributable to MT. First, 59.4% believed the need for integration of technology into the profession has increased or will increase in the future, while only 3.1% stated a slight decrease and 31.3% felt or expected no change in its utilisation. Second, 68.8% of respondents reported a slight or major increase in their translation speed due to the adoption of MT, with 21.9% suggesting the speed will remain constant, and 6.3% indicating a slight decrease in translation speed due to MT. Lastly, 68.7% of the respondents already experienced or foresaw an increase in the volume of post-editing work received, while 21.9% stated no changes, and a surprising 3.1% reported a major decrease.

Finally, there were three topics where the majority of respondents asserted that MT had no discernible impact. The first, already referred above, pertains to fees, with 43.8% believing that MT neither positively nor negatively has affected or will affect this aspect. The second topic concerns the quality of work, with 40.6% stating that MT neither has

had or will have impact on this aspect. Yet, 34.4% believe that MT has enhanced or will enhance the quality of their work, either slightly or significantly, while 21.9% anticipated a decrease in quality. The final topic, relating to the need for training, saw 46.9% of respondents asserting that MT has not impacted nor will impact this requirement in the future. Nonetheless, it is noteworthy that 37.6% expected a slight or major increase in the need for training, while only 3.1% experienced or foresaw a major decrease in these training requirements.

To delve deeper into the results of this section, the responses were segmented between users and non-users of MT, as illustrated in Figure 44 and Figure 45, which are both shown on the next page so that they can be easily compared. This analysis revealed that, in most cases, respondents who do not use MT often indicate that MT has no impact on their work. Conversely, those who do use MT tend to report either a positive or negative impact on their work.

This contrast is particularly evident in areas such as payments received or the use of technology. Among non-users, 62.5% indicate no impact, whereas users tend to report a decrease in payments (45.8%) and an increase in the use of technology (70.8%). There are also notable differences between users and non-users in areas such as translation speed and the volume of post-editing work received.

| Impact that MT has had/may have in the future in respondents' work as translators - MT Users - | | | | |
|---|---|---|---|---|
| **Topics** | **Decrease** | **No decrease / increase** | **Increase** | **I do not know** |
| **The payment you receive** | 45.8% | 37.5% | 12.5% | 4.2% |
| **The quality of your work** | 20.8% | 41.7% | 37.5% | 0.0% |
| **Your use of technology (e.g.: CAT, productivity tools)** | 4.2% | 20.8% | 70.8% | 4.2% |
| **Your training needs** | 4.2% | 45.8% | 37.5% | 12.5% |
| **Your translation speed** | 4.2% | 16.7% | 75.0% | 4.2% |
| **The volume of post-editing work you receive** | 4.2% | 12.5% | 75.0% | 8.3% |
| **The volume of translation work you receive** | 41.7% | 25.0% | 29.2% | 4.2% |

*Figure 44 - Responses to survey question #15 segmented by MT users*

| Impact that MT has had/may have in the future in respondents' work as translators - MT Non-Users - | | | | |
|---|---|---|---|---|
| **Topics** | **Decrease** | **No decrease / increase** | **Increase** | **I do not know** |
| **The payment you receive** | 25.0% | 62.5% | 0.0% | 12.5% |
| **The quality of your work** | 25.0% | 37.5% | 25.0% | 12.5% |
| **Your use of technology (e.g.: CAT, productivity tools)** | 0.0% | 62.5% | 25.0% | 12.5% |
| **Your training needs** | 0.0% | 50.0% | 37.5% | 12.5% |
| **Your translation speed** | 12.5% | 37.5% | 50.0% | 0.0% |
| **The volume of post-editing work you receive** | 0.0% | 50.0% | 50.0% | 0.0% |
| **The volume of translation work you receive** | 50.0% | 37.5% | 12.5% | 0.0% |

*Figure 45 - Responses to survey question #15 segmented by MT non-users*

#### *4.1.3.2 Comments on the impact of MT in translators' work*

Towards the conclusion of this section, respondents were extended an invitation to share their comments, encompassing reflections on the discussed topics or any other considerations they deemed pertinent in this domain:

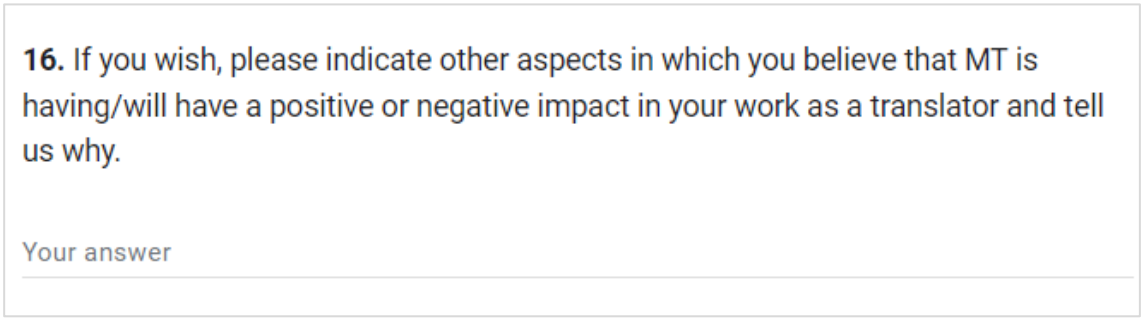



*Figure 46 - Survey question #16*

Given the non-mandatory nature of this question, seven respondents, constituting 21.9% of the total participant pool, chose to provide comments in this section. For the sake of an easier understanding of the respondents' comments, their key words were highlighted and classified according to the main topics they address, as shown in Figure 47 below.

| **Respondents' comments** | **Topic** |
|---|---|
| The **devaluation of human labour**, which translates into a **reduction in fees** and the **frequency** with which **translations** are requested. | Human vs. machine / Fees / Work volume |
| I see that there are fewer and **fewer offers of translation jobs and more of MTPE**. | Translations vs. MTPE |
| At the level of textual translation, and in the case of ChatGTP, it has already "explained"/confirmed with great accuracy (I always checked with Google later) complex concepts that are very difficult to find (or to confirm their exact equivalent in the target language) through a search on Google, IATE, Linguee or Proz and Translators Café forums. Google Translate has also helped but it is not as competent or practical as ChatGTP (especially because ChatGTP is not simply an MT service). Moreover, I fear that, **while ChatGTP will help us for now, it may largely reduce our workload and/or our fees or that our work as translators will be reduced to MTPE**. In fact, with all these amazing developments in AI, I have wondered **if it won't be better to change my profession in a maximum of 5 years, since it seems to me that AI in this field will become much more sophisticated** and this will happen very quickly. In terms of audio-visual translation, I have not yet felt the need to use ChatGTP (and I have also used Google Translate sporadically). | ChatGPT / Work volume / Fees / MTPE |

| Respondents' comments | Topic |
|---|---|
| **MT and MTPE is having a very negative impact on my work** because **agencies are "selling" MTPE as a miracle and "cost-effective" solution, at the same price as proofreading**. As a result, there is a widespread practice of **agencies hiring low-cost translators to translate, while more experienced translators are relegated to the role of "human translation editors"**. I usually send in corrections and demand to be paid the translation price, not the revision price. And in the MTPE jobs I've done, I've always received the translation price. On the other hand, **I can't raise my rates with the agencies, and this is affecting my income**. And let's put it this way: it would be useful to stop talking about "automatic translation" or "machine translation" and start talking about "artificial translation" or "machine-generated translation". It's hard enough to categorise translation as "human" when only humans really translate. Machines have neither understanding nor knowledge, much less make decisions based on true intelligence. **The outputs of machines, although they may sometimes seem perfect, are worth zero without human intervention**. The price drop caused by MTPE is having a very negative impact on other market segments. In any case, **if a customer wants price, there's no point in talking about quality**. I don't go along with price cuts or too short deadlines. **The brain processes meaning, it processes complete sentences and the whole text. I don't have to discount my work**. Lawyers also use drafts and don't do discounts. We have to be realistic: translation takes as long as it takes. Those who have more resources, more knowledge and more experience work faster. Those who don't know or have no experience or quality blindly accept the machine's output. What's more, it's up to me as a specialist to decide what I use in my work. Nobody asks a doctor or a mechanic what tools they use. And rarely do doctors or mechanics tell their clients what tools they use. Lawyers certainly don't tell their clients what drafts they use. If I don't think MTPE is in my clients' best interests, I don't use it and I don't recommend it. **We would all benefit if public opinion were to be clarified. MT is good for specific cases, for others you need to hire a specialist and pay them accordingly**. Aspirin is one thing, an antibiotic is another, and only doctors can prescribe antibiotics. | MTPE / Fees / MT quality / Human vs. machine |
| **Negative, in the audiovisual sector, due to the increased conditioning imposed** by more parameters, reduced delivery times and the idea of **post-editing as revision work, wrongly seen as simpler**, despite the fact that **almost the entire project requires corrections**. | AVT / MTPE |
| **Machine translation turns translators into mere proofreaders, taking away the value of human translation work and failing to appreciate how tiring proofreading work is** (most of the time, far more tiring than translation work in mental, visual and intellectual terms). It can also **impoverish lexicons**, since the same source-translation word pairs can be chosen automatically, thus **weakening the final text**. | MTPE / MT quality |

| Respondents' comments | Topic |
|---|---|
| **Help with checking and clearing up doubts**. | MT as a tool |

*Figure 47 - Respondents' comments on survey question #16*

Respondents predominantly expressed negative sentiments regarding the influence of MT on their work. These comments primarily centred on the decrease in the volume of translation work, reduction of fees, substitution of human translators with machines, and a degradation of vocabulary richness, among other concerns. However, amidst the prevailing negativity, it is important to highlight two positive remarks: the recognition of ChatGPT as a valuable resource for terminology and the acknowledgment that MT aids in verifying and clarifying doubts.

When comparing these results with the ones reported by Cadwell *et al.* (2017), some similarities can be found. In the case of that study, there were also concerns about MT disrupting the translator's thought process and creativity. On the positive side, some participants noted speed and productivity gains and considered MT as a good resource for terminology.

#### *4.1.3.3 Key findings on the impact of MT in respondents' work*

The key findings from the information provided by the respondents in this section of the survey are:

- There are notable differences in how users and non-users of MT perceive its impact on their work.
- Users believe that both payments and the volume of translation work have been or will be negatively affected, whereas non-users anticipate that payments are or will remain unchanged and the volume of translation work has slightly decreased or will in the future.
- Other notable disparities in perceptions relate to the use of technology, translation speed, and the volume of post-editing work received. MT users have experienced or expect to experience substantial increases in these aspects, whereas non-users anticipate no change.
- Overall, regardless of whether they use MT or not, respondents expressed predominantly negative sentiments towards this technology. Concerns mainly revolve around fees, the potential substitution of human translators with machines, the degradation of vocabulary richness, or the decrease in translation work volume.

- Nonetheless, some positive remarks were made regarding the use of these tools as a resource for terminology and for clarifying doubts.

### 4.1.4 Ethical concerns

The final segment of the survey delved deeply into the ethical considerations currently arising regarding MT. Our primary objective was to ascertain the level of awareness among translators regarding these concerns and to identify any additional ethical dimensions that would deserve consideration for a conscientious approach to this subject matter. To achieve this, participants were presented with nine statements and were asked to provide their assessment using an eight-point Lickert scale.

#### *4.1.4.1 Copyright/Authorship – MT systems training*

Our initial inquiry sought to get respondents' perspectives on the issues surrounding authorship and copyright, particularly in light of the potential scenario where translators' work might be utilised to train MT systems without their explicit knowledge or consent.

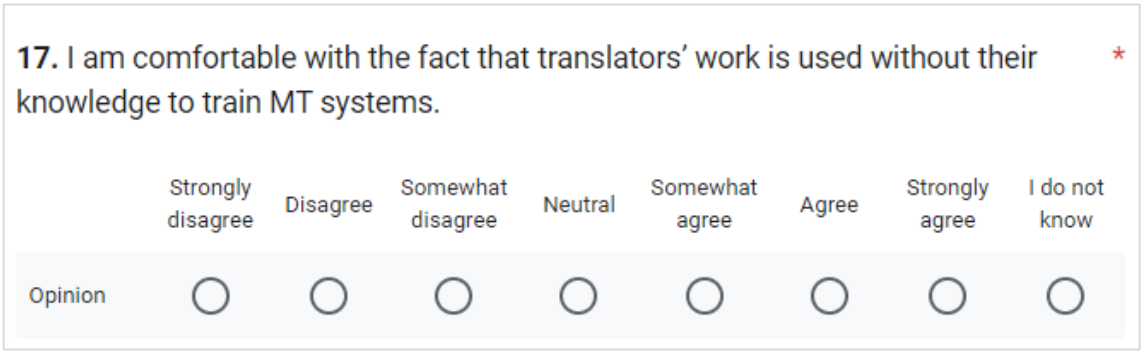



*Figure 48 - Survey question #17*

As depicted in Figure 49 below, the findings revealed that a large majority of respondents (75%, comprising 24 out of 32 respondents) expressed disagreement with the statement, indicating their opposition to the notion of their work being utilised to train MT systems without their awareness. Notably, within this 75%, the majority (34.4%) strongly disagreed with the statement. Conversely, only eight respondents (25% of the total) either remained neutral or expressed varying degrees of agreement with the statement.

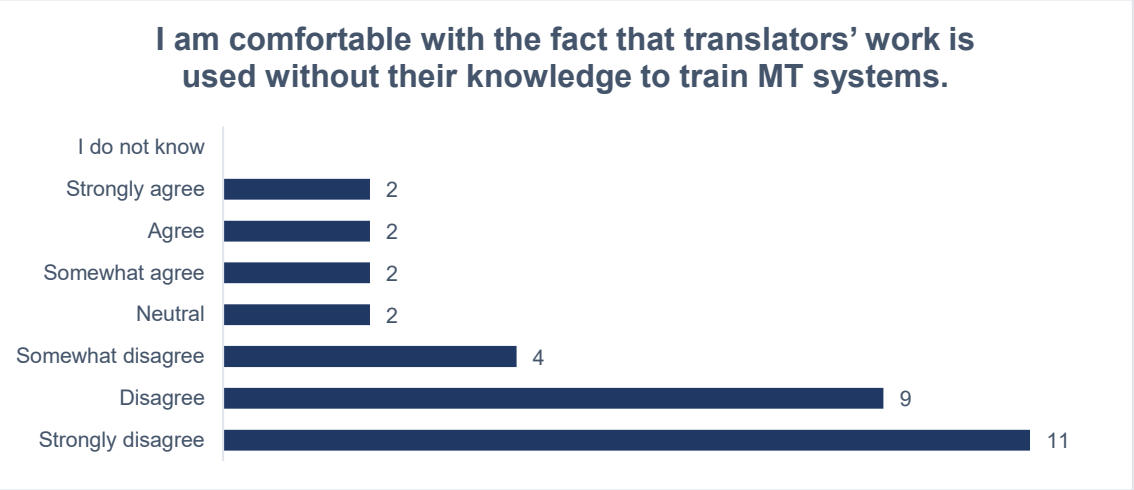



*Figure 49 - Responses to survey question #17*

These results are not surprising and clearly show that issues regarding copyright and authorship within MT are on the respondents' minds. Nevertheless, as noted previously in section 4.1.2.6 — Type of MT systems used — 67% of the respondents use free online MT systems, which are trained using corpora produced by translators without their knowledge. Addressing this issue, Forcada (2023) highlights the case of sentence-aligned corpora that are crawled from the internet using hard-to-detect technology and then used to train commercial MT systems. The author hopes that his article provides food for thought and contributes to the ongoing debate around this issue. In another article, Mantecón (2023) proposes a system of equitable compensation where translators would receive remuneration for the use of their work by MT systems that do not ask for permission. These amounts would be collected by an organisation acting on behalf of all authors/translators, similar to Sociedade Portuguesa de Autores (SPA) in Portugal or Centro Español de Derechos Reprográficos (CEDRO) in Spain, as the author suggests.

#### *4.1.4.2 Copyright/Authorship - MTPE*

The subsequent inquiry, which was also related to copyright and authorship apprehensions, addressed the scenario where a translator asserts complete authorship of a translation, notwithstanding that it originated from a post-edited MT output.

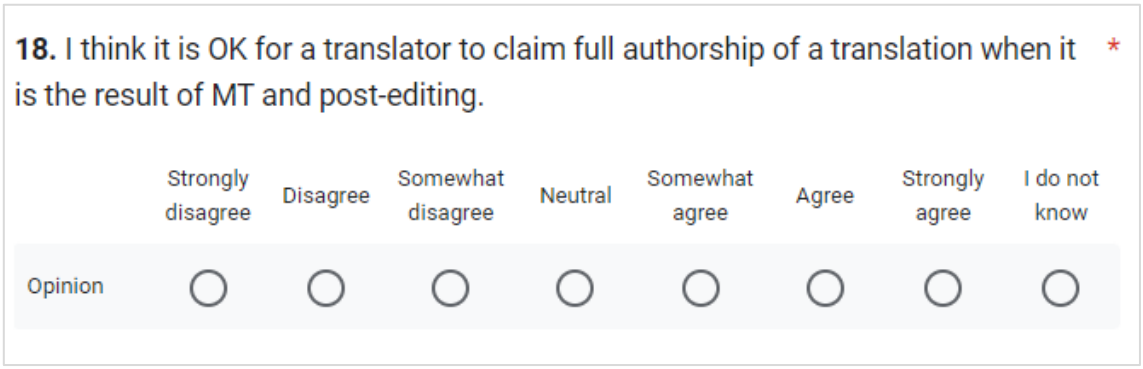



*Figure 50 - Survey question #18*

As indicated by the results, opinions were evenly spread across the scale, though the majority of respondents expressed agreement with the statement (59.4%, equating to 19 respondents). Additionally, there were five respondents who remained neutral, and six respondents (18.8% of the total) who either somewhat disagreed or disagreed with the statement. It is worth highlighting that none of the respondents stated that they strongly disagreed with the statement.

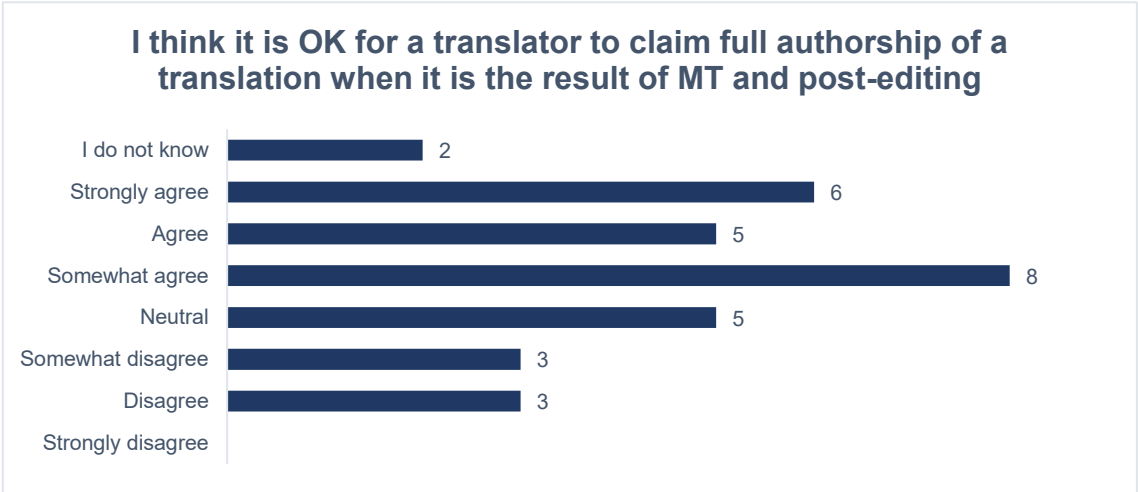



*Figure 51 - Responses to survey question #18*

Contrary to the results of the previous question, there was no clear majority opinion regarding the presented sentence, although slightly more respondents agreed than disagreed with it. This may reflect the lack of guidelines and legislation in this area, leaving translators feeling they deserve recognition for their PE work even though they acknowledge they did not create all the content. As mentioned in section 2.3.2.1 — Copyright — Séjourné (2020) suggests that the copyright of an AI-generated work

(which, in our case, would be the MT output subject to PE by a translator) should be granted to the person who prepared and published it, provided the designer of the technology does not object.

#### *4.1.4.3 Translators/post-editors status*

Question #19 was about the translator/post-editor status and the value that is attributed to these two functions.

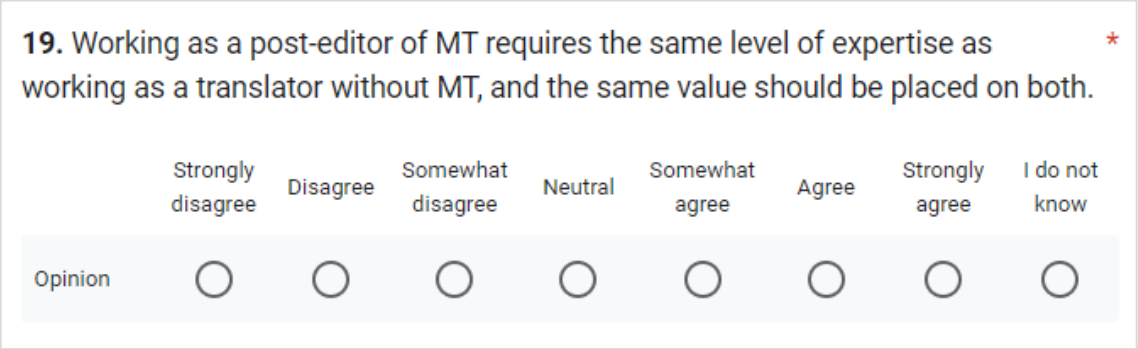



*Figure 52 - Survey question #19*

The responses indicated an evident consensus with the statement, with 12 respondents expressing a strong agreement and an additional 10 respondents indicating agreement or some degree of agreement. This cumulative total constituted a majority of 68.8%, while only 25% expressed disagreement or some degree of disagreement. Notably, 6.3% of respondents remained neutral on the matter.

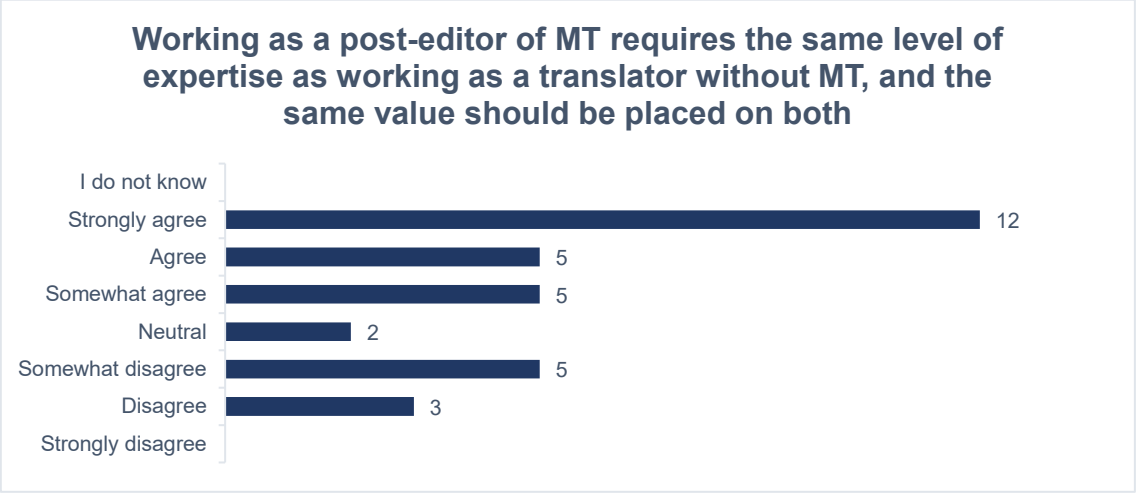



*Figure 53 - Responses to survey question #19*

These results are clearly aligned with what do Carmo (2020) and Rico & del Mar Sánchez Ramos (2023) advocate, as mentioned in section 2.3.2.2 — Role and status of the translator These authors reflect on the translator's role in light of the profession's challenges posed by technology, particularly MT and AI, and emphasise the central role

of the translator as a post-editor and language advisor. According to do Carmo (2020), PE is as demanding, essential and specialised as translation itself and should not be seen merely as a time- and cost-saving strategy. Supporting this view, Rico & del Mar Sánchez Ramos (2023) place translators in the centre of the translation ecosystem, assigning them the role of language advisors who navigate technology, collaborate with various partners, and maintain a distinct professional status.

#### *4.1.4.4 Bias*

The next question included a statement reflecting the ethical concern about bias.

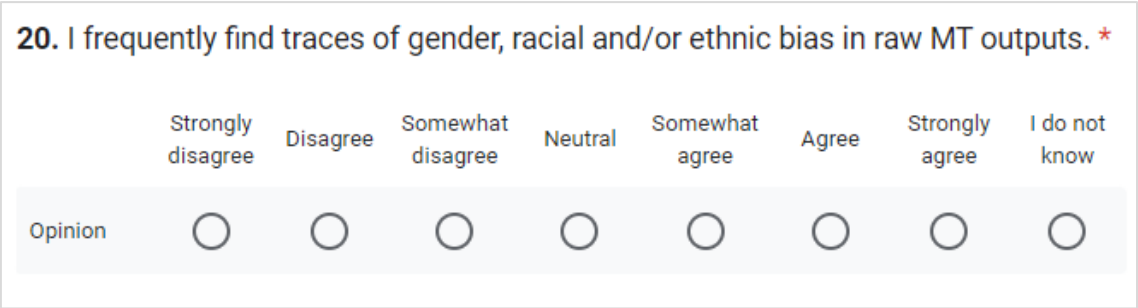



*Figure 54 - Survey question #20*

As depicted in Figure 55 below, respondents overwhelmingly supported the statement, with a substantial majority of 78.1% (equivalent to 25 respondents) indicating strong agreement, agreement, or some level of agreement. Conversely, only one respondent dissented from the statement. Additionally, five respondents (15.6%) maintained a neutral stance.

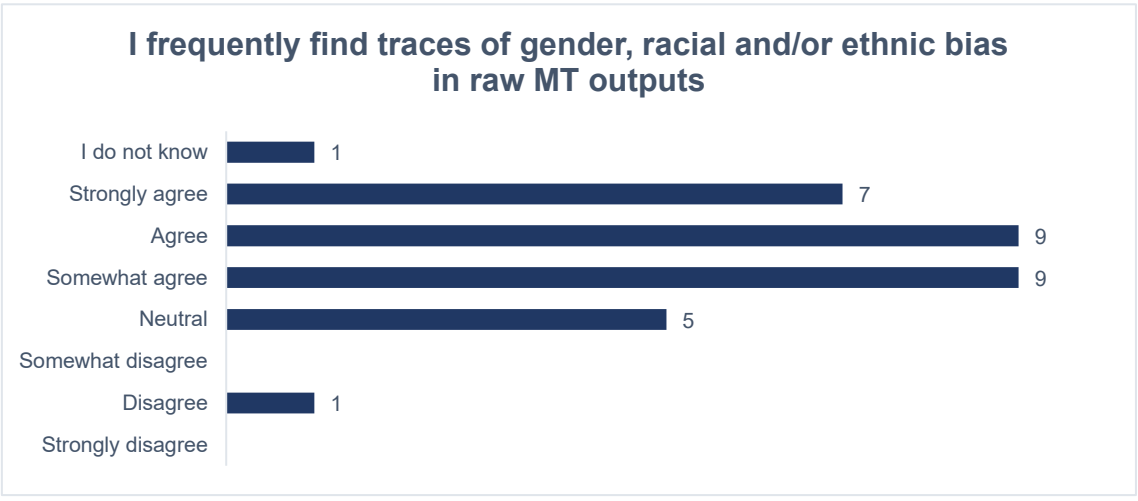



*Figure 55 - Responses to survey question #20*

These results reinforce the importance and relevance of this issue for translators. As mentioned in section 2.3.2.3 — Bias — Bianchi *et al*. (2023) confirmed in their research that translations generated by commercial systems tend to produce text that appears to

be authored by individuals who are more male and older than the actual source. This discovery highlights that language is more than mere information content; it encompasses crucial social dimensions essential for conveying the full meaning of the message. Therefore, eliminating bias should be a priority for stakeholders in this ecosystem.

#### *4.1.4.5 Translation quality*

Respondents were also asked to share their views on whether the quality of post-edited MT outputs is comparable to the quality of a translation done without the use of MT.

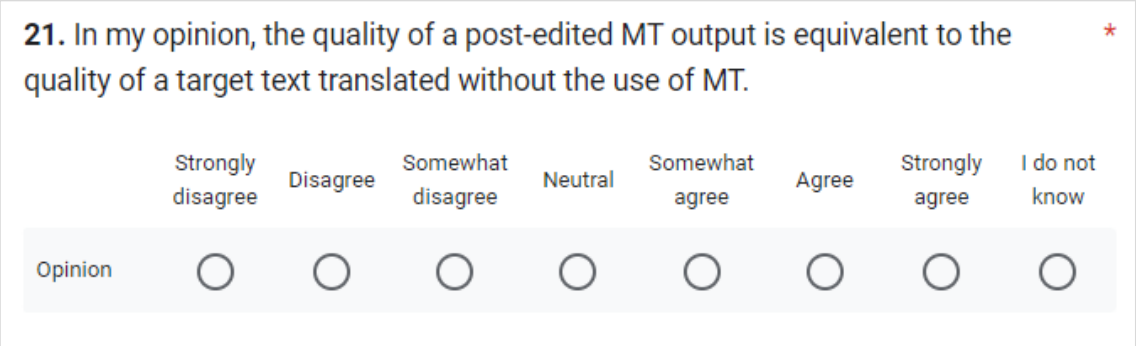



*Figure 56 - Survey question #21*

In contrast to the preceding question, respondents voiced their disagreement with the statement, with a majority of 56.3% (18 respondents) indicating some level of disagreement, ranging from "somewhat disagree" to "strongly disagree". On the other hand, 37.5% (12 respondents) expressed their agreement with the statement. Notably, only two respondents adopted a neutral stance on this matter.

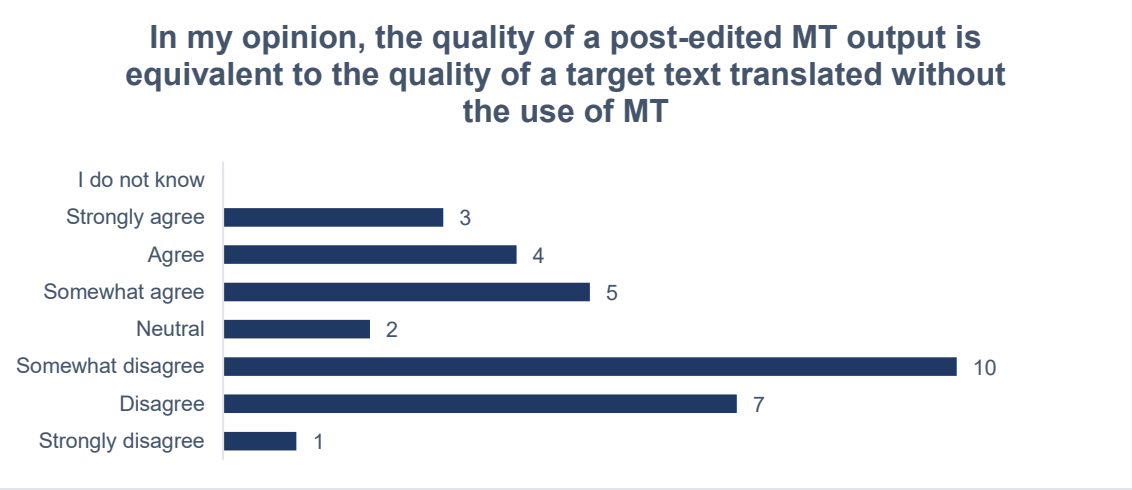



*Figure 57 - Responses to survey question #21*

These results are interesting given that the majority of respondents previously agreed that working as a post-editor of MT requires the same level of expertise as working as a translator without MT, and that both roles should be equally valued. The apparent contradiction between the two responses might indicate that translators are unsure about their role and may lack specific PE knowledge and training to develop skills equivalent to those they have for translating without MT. Another explanation might be the perspective advanced by Rico & del Mar Sánchez Ramos (2023) who highlight the various nuances of quality in the context of MTPE. They mention factors such as the target audience, the intended purpose of the final text, and pre-established agreements with the client or end user, which can lead to different quality standards like "good enough quality" or "human translation quality," the latter being the gold standard for professional translators. These different quality standards result in varying degrees of post-editing, from "light post-editing" to "full post-editing," depending on the intended final outcome.

#### *4.1.4.6 Personal data protection*

Question #22 raised the ethical concern of personal data protection. The respondents were asked to express their opinion about the following statement:

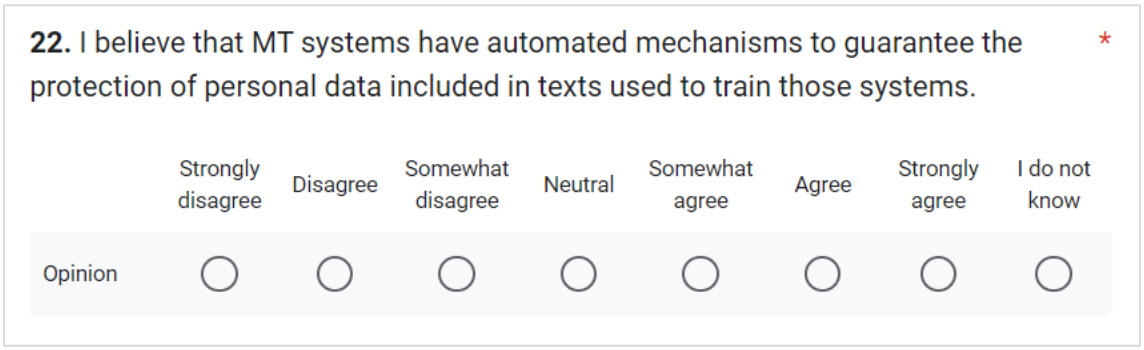



*Figure 58 - Survey question #22*

The respondents' selections indicated a prevailing tendency towards disagreement (40.6%). However, there was also a notable portion of respondents who either remained neutral (25%) or stated they did not know (21.9%). Additionally, only four respondents (12.5%) indicated some degree of agreement by stating they "somewhat agree" with the sentence.

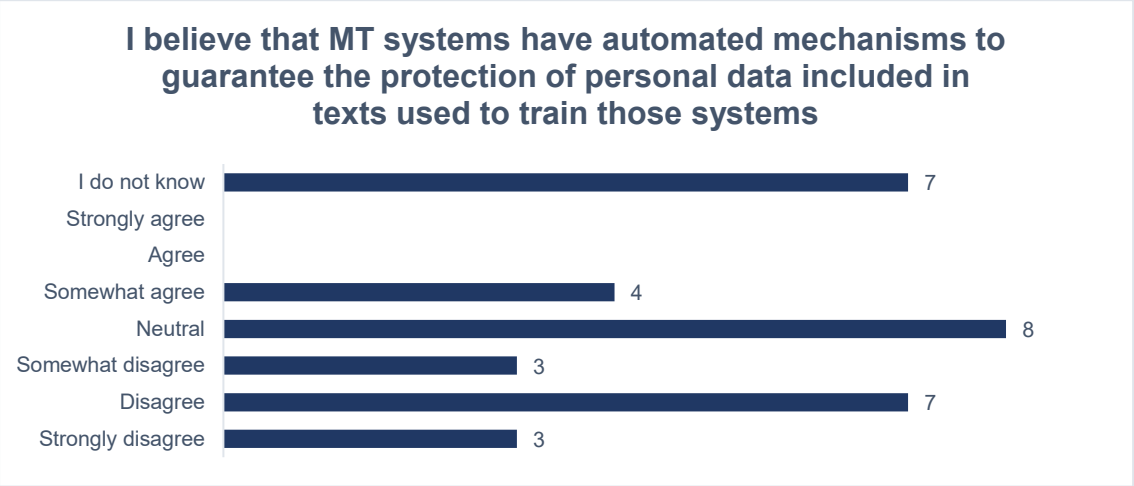



*Figure 59 - Responses to survey question #22*

These results reveal the fears translators have when dealing with MT systems and the lack of knowledge about the way these systems work. The fact that the majority either declared they do not know or are neutral regarding this issue is a confirmation of that. Nevertheless, this issue is of crucial importance and poses several challenges to MT systems developers in order to comply with exiting legislation regarding personal data protection. As mentioned by Clark *et al.* (2024, para. 1.1 The GDPR and AI systems) it is frequently difficult to distinguish personal data from non-personal data, which raises the probability that AI systems will handle personal data at some stage during their lifecycle. But both the recently approved AI Act and the existing General Data Protection Regulation (GDPR) are designed to work closely together, with the latter 'bridging the gap' regarding individual rights in situations where AI systems use data about living people.

#### *4.1.4.7 Confidentiality*

Moving on to question #23, we sought to gather the respondents' perspectives on how confidential information is handled when MT systems are employed.

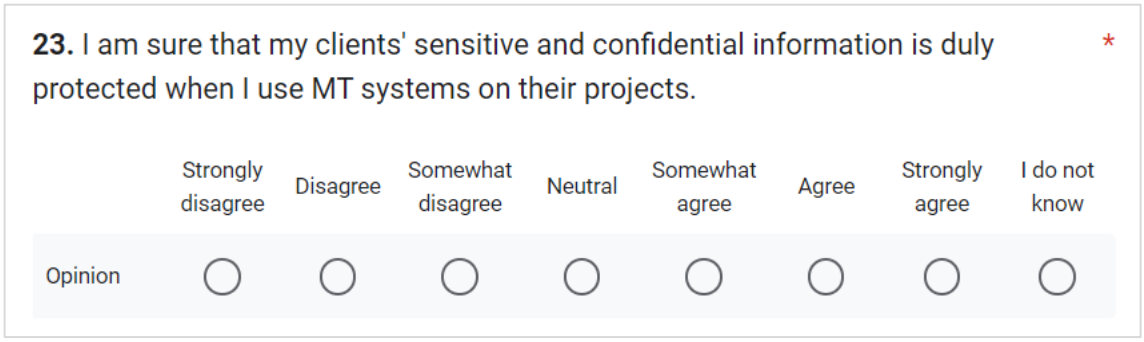



*Figure 60 - Survey question #23*

Interestingly, the most frequently selected option on the Lickert scale was "I do not know" (28.1%), followed closely by "Neutral" (21.9%). Notably, both agreement and disagreement options were chosen nearly equally, with a slight preference towards the disagreement options.

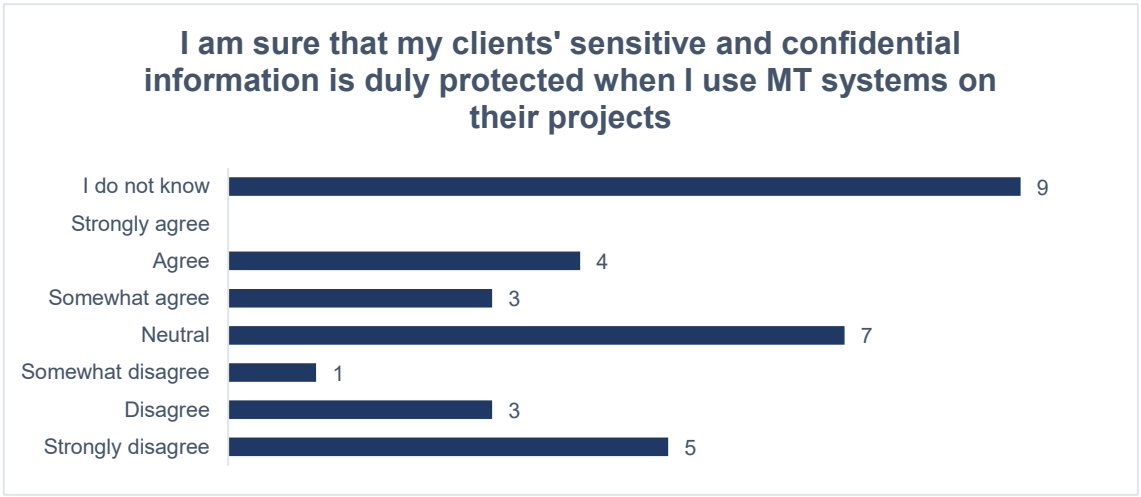



*Figure 61 - Responses to survey question #23*

Once again, these results highlight some uncertainty among translators, which is particularly concerning given that the majority of respondents reported using free online MT systems, which typically offer less protection for safeguarding confidential information. Furthermore, confidentiality is a fundamental aspect emphasised in the codes of ethics of the vast majority of professional translators' associations, as evidenced by the following examples:

- "[T]o hold in confidence, not divulge, and protect privileged and/or confidential information obtained in the course of our work." (ATA, 2023)

- “Respect confidentiality with regard to any and all materials received from their clients.” (IAPTI, 2023)
- “Members shall maintain complete confidentiality at all times and treat information that may come to them in the course of their work as privileged information, not to be communicated to any third party without prior written authority.” (ITI, 2023)

#### *4.1.4.8 Crisis Contexts*

Question #24 centred on the utilisation of MT systems in crisis contexts, where the urgency for rapid translations may warrant the use of raw or lightly post-edited MT outputs.

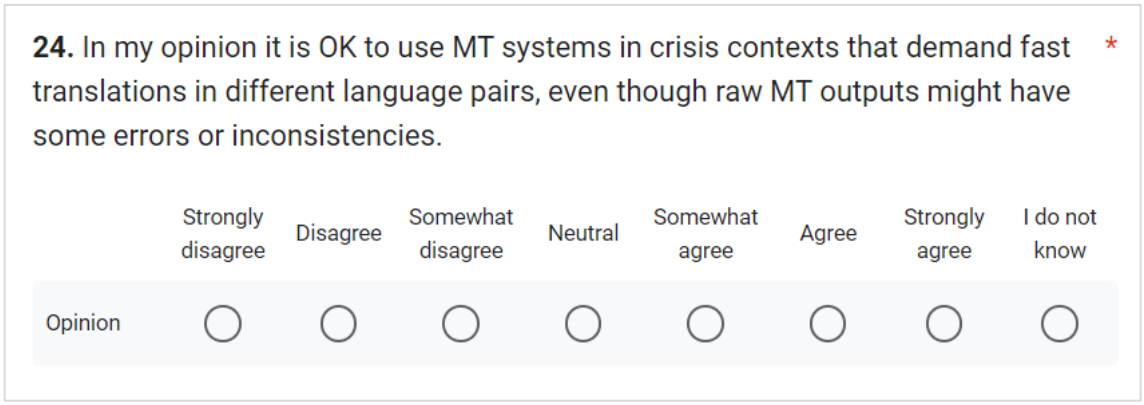



*Figure 62 - Survey question #24*

The survey responses indicated a clear inclination among participants towards endorsing the use of MT in crisis contexts. A substantial majority of 68.8% of respondents expressed agreement, ranging from "somewhat agree" to "strongly agree", with the affirmation and only 28.1% of the respondents expressed some kind of disagreement.

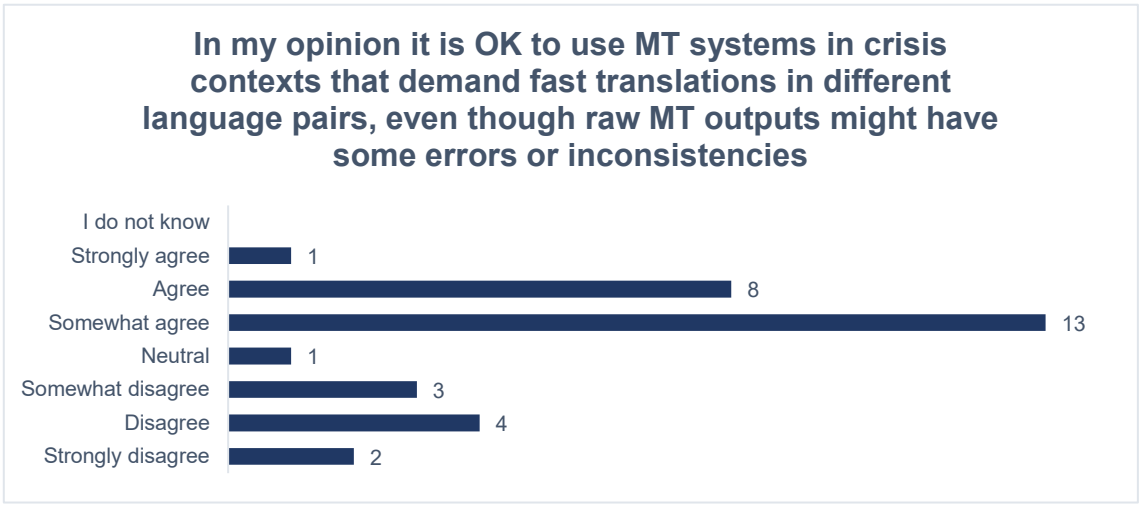



*Figure 63 - Responses to survey question #24*

These results align with the recommendations of authors such Nurminen & Koponen (2020) and Federici *et al.* (2023) who advocate for the use of MT for underserved groups or in crisis contexts, although with certain precautions. They suggest carefully analysing contexts for suitability before implementing raw MT, considering quality issues and other aspects of acceptability (Nurminen & Koponen, 2020), and focusing on human-computer interaction and the role of humans in quality assurance processes (Federici *et al.*, 2023).

#### *4.1.4.9 Environmental impact*

The final question in this section revolved around the environmental impact of MT systems vs. the advantages these systems bring to the society.

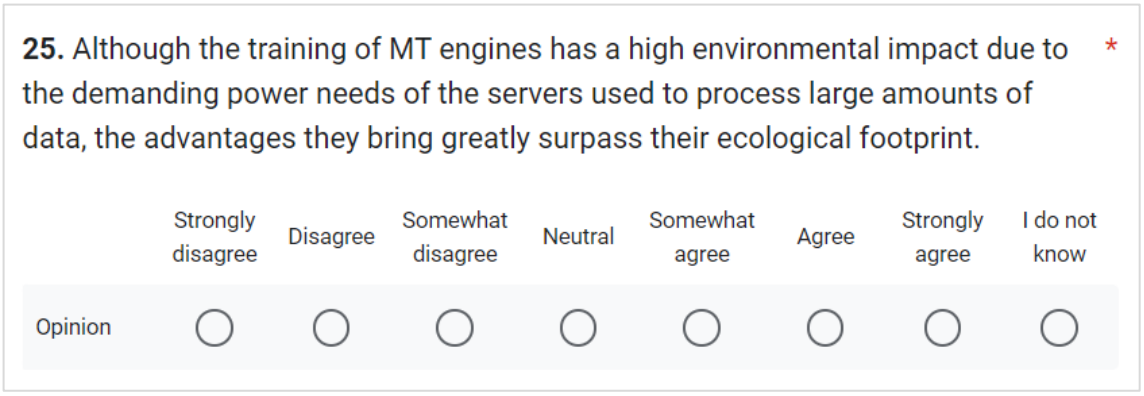



*Figure 64 - Survey question #25*

Responses indicated a clear disagreement among translators with the sentence, as 56.3% of respondents stated that they either "strongly disagree," "disagree," or "somewhat disagree". Conversely, 18.8% of respondents expressed some degree of agreement, with none selecting the "strongly agree" option. Additionally, 6.3% of respondents indicated uncertainty by selecting "I do not know."

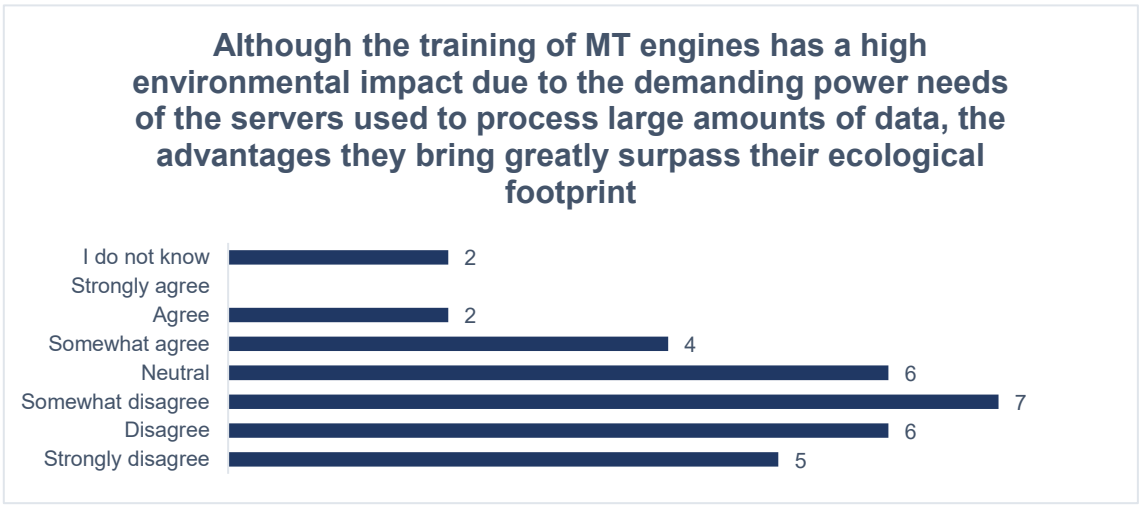



*Figure 65 - Responses to survey question #25*

The results are consistent with other responses and comments made by the respondents, indicating that they do not perceive enough value in MT to justify its use and the ecological footprint it entails. Therefore, it is crucial to implement measures aimed at reducing the volume of $CO_2$ emissions from the GPUs used to process all the data involved in MT systems' training and operation. This is important not only to increase acceptance among professional translators but also to improve the quality of life on the planet and align with initiatives such as the European Green Deal (see European Commission, n.d.).

#### *4.1.4.10 Ethical concerns responses - summary table*

To provide a more comprehensive understanding of respondents' answers in this survey section and to visually represent the trends observed for each response, Figure 66 below presents a table summarising the answers and categorising them based on the ethical concerns addressed in each sentence of this section:

| Ethical concern | Statement | Disagreement | Neutrality | Agreement | Lack of knowledge |
|---|---|---|---|---|---|
| Copyright / authorship | I am comfortable with the fact that translators' work is used without their knowledge to train MT systems. | 75.0% | 6.3% | 18.8% | 0.0% |
| Copyright / authorship | I think it is OK for a translator to claim full authorship of a translation when it is the result of MT and post-editing | 18.8% | 15.6% | 59.4% | 6.3% |
| Translator / post-editor status | Working as a post-editor of MT requires the same level of expertise as working as a translator without MT, and the same value should be placed on both | 25.0% | 6.3% | 68.8% | 0.0% |
| Bias | I frequently find traces of gender, racial and/or ethnic bias in raw MT outputs | 3.1% | 15.6% | 78.1% | 3.1% |
| Quality | In my opinion, the quality of a post-edited MT output is equivalent to the quality of a target text translated without the use of MT | 56.3% | 6.3% | 37.5% | 0.0% |

| Ethical concern | Statement | Disagreement | Neutrality | Agreement | Lack of knowledge |
|---|---|---|---|---|---|
| Data protection | I believe that MT systems have automated mechanisms to guarantee the protection of personal data included in texts used to train those systems | 40.6% | 25.0% | 12.5% | 21.9% |
| Confidentiality | I am sure that my clients' sensitive and confidential information is duly protected when I use MT systems on their projects | 28.1% | 21.9% | 21.9% | 28.1% |
| Crisis contexts | In my opinion it is OK to use MT systems in crisis contexts that demand fast translations in different language pairs, even though raw MT outputs might have some errors or inconsistencies | 28.1% | 3.1% | 68.8% | 0.0% |
| Ecological footprint | Although the training of MT engines has a high environmental impact due to the demanding power needs of the servers used to process large amounts of data, the advantages they bring greatly surpass their ecological footprint | 56.3% | 18.8% | 18.8% | 6.3% |

*Figure 66 - Summary of the responses given in the "Ethical Concerns" section*

#### *4.1.4.11 Comments on ethical questions*

Following the nine sentences that respondents were prompted to rate based on their level of agreement or disagreement, we incorporated two additional fields inviting participants to provide their opinions. In the first field, respondents were encouraged to share any additional ethical concerns they were aware of that had not been addressed in the aforementioned sentences:

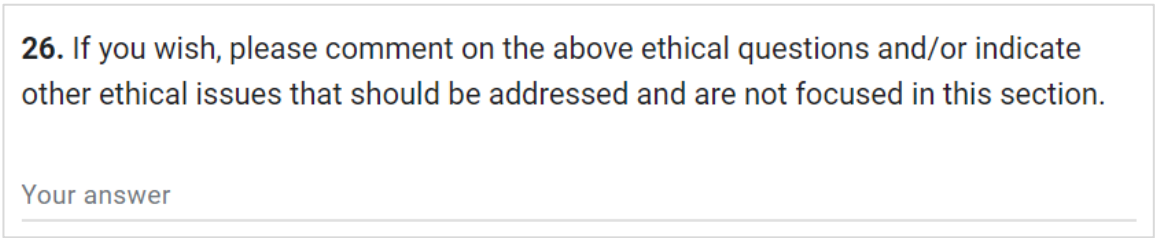



*Figure 67 - Survey question #26*

Of the 32 respondents who took part in the survey, seven, making up 21.9% of the total, shared thoughts on ethical matters. The table below shows their comments[9]. Within the table, certain words are highlighted, representing key terms identified during a qualitative review of those comments. These terms are further categorised based on the ethical concerns they raise.

| **Respondents' comments** | **Ethical concern** |
|---|---|
| **Safety** of the translated information | Safety |
| The question of **wages** and the **replacement of the human being** by the **automation of professions** containing a **creative element** that would be advisable to safeguard. | Fees / Machine replacing humans / Automation of creative professions |
| The use of **MT in healthcare settings** and the **risks** it may have in **patients** (research is being carried out on this in Portugal), but also in **educational contexts** and the impact it may have on **migrant education** (e.g. Ukrainian migrants in Portuguese schools), **translation in crises contexts**, etc. | MT in healthcare and education sectors / MT in crisis contexts |
| Concern for **author** and **translator copyrights**. | Copyright / Authorship |
| I think translators should be compensated for the unmeasured **web scraping** of certain companies that used bilingual texts for commercial use. Just because it is online it does not mean there is no owner. This would also mean that **translators would stop being invisible** once and for all. A **post-edited text** may have an **identical quality** to a **text without the use of artificial means**, depending on who edits it.<br>**Translators must claim control** of their workflow. If they use the agencies' tools and platforms and act according to agency guidelines, they should be **considered as employed translators**. The **human-in-the-loop** must be **replaced by the machine-in-the-loop**. | Translators' role and status / Quality of MTPE |
| **Confidentiality** of customer data. This is of the **utmost importance** and can result in major **legal complications**. | Confidentiality |
| The **abusive use of automatic systems**, MT systems in this case, **devalues the human intellect** and **fosters laziness in learning and thinking** from one's own head. | Cognitive human qualities |

*Figure 68 - Respondents' comments on ethical concerns*

[9] The respondents wrote their comments in Portuguese. The text presented is a translation of those comments done by the author.

Respondents highlighted several meaningful concerns regarding MT systems. They expressed worries about the safety and confidentiality of information, particularly regarding clients' data inputted into these systems. Additionally, there is apprehension about the role of translators in light of the potential for machines to replace human creativity. Concerns extend to the fees paid for translation services in this evolving landscape. There is also unease regarding the potential devaluation of human intellect and the demotivation of intrinsic learning and thinking abilities due to abusive use of MT. Furthermore, respondents expressed concerns about the implications of MT systems in critical areas such as healthcare, education, and crisis contexts. Some of these concerns are coincident with the ones expressed in the survey conducted by Cadwell *et al.* (2017) where the respondents also mentioned fears about MT disrupting the translator's thought process and creativity.

#### *4.1.4.12 Overall opinions on MT systems*

The second field incited the respondents to give their opinion on MT systems in general:

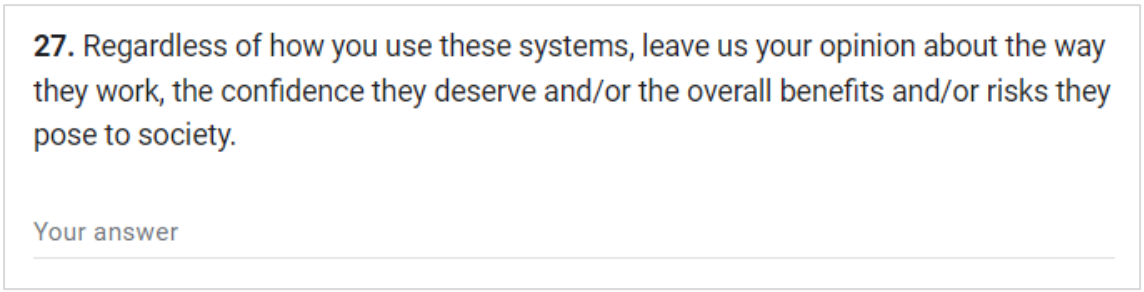



*Figure 69 - Survey question #27*

Out of the total 32 survey respondents, 14 individuals, accounting for 43.8% of the sample, shared their perspectives on MT systems. This was the highest number of responses ever received for this type of open-ended question in the survey, indicating the participants' keen interest in the topic. It could also be explained by the fact that it was the final question of the survey, prompting participants to share their thoughts before concluding. To enhance clarity, their comments are presented below, with important words highlighted and each comment classified according to the main topics covered.

| **Respondents' comments** | **Topic** |
|---|---|
| **Good machine translation systems** are **useful** to **improve time management** and are **reliable if** - and only if - are followed by a **very rigorous post-editing**. The issue of **potential data protection hazards** is **not greater or smaller than** in any **other contexts where digital tools are used** for work and where sensitive data is communicated and transmitted online. | MT quality / Data protection |

| Respondents' comments | Topic |
|---|---|
| These systems, if properly used, can be a **huge breakthrough** in this area | Technological evolution |
| They allow us to **adapt to a world that is extremely fast**, but they bring **nothing good to the translation itself**. As a translator, the more experience I get, the less I use machine translation. Unfortunately, the **growth of machine translation is lowering the quality standards** on the part of the **consumer**, who is accustomed to reading **low-quality texts** and is **no longer able to recognise the value of good writing**. | MT quality |
| I think the paradigm needs to change. Although these are **good technologies that help many people**, there are **many risks for those who do not know how they work** and what risks they present. We should do **more research** related to this and to **machine translation literacy** in Portugal (see Prof. Lynne Bowker) and also bring this to the public so that the government knows that there should be **investment in more translators' pools for the National Health System, Justice Department and others** in order to ensure that everyone in Portugal has **equal access to health, education and justice** and ensure that **no information is misinterpreted or may generate communication problems**. | MT research / MT literacy / MT in public services |
| Whenever I translate texts with **confidential information**, I try to use machine translation systems that ensure the **protection of the data that is being entered**. Otherwise, I try to **translate only small expressions** or even **loose words** to help me **unlock the translation process**. I would **not rely on such a system to produce a translation in full**, since, from my experience, **post-editing is more time consuming** and is **not worth all the extra work**, considering that the information entered will not be treated as confidential. | Confidentiality / MTPE |
| In general, I think that **machine translation systems** are a very **useful and practical tool**. I do **not entirely align with the thesis** that they may ever **replace human translators**. On the contrary, I believe that they have **created new jobs** for those who have the skills to translate, namely through **post-editing** or **quality control** of the systems. Still, I have some **fears** about the use of machine translation when it is reflected in the **precariousness of the translator's work** and consequent **reduction of the translations' quality**. Furthermore, I am also **concerned** that these **systems are opaque** and that it is not entirely clear to the user **how their data are processed**. | Translators' role and status / MT quality / Data protection |

| Respondents' comments | Topic |
|---|---|
| They can be **extremely useful** and **save us a lot of time** (and consequently mental and physical effort), but they should always **be treated with caution**. In relation to the public, they are a **fast, complete and pleasant source of information**, although sometimes resorting (in the case of ChatGPT) to cliché phrases (which is also understandable, so as not to offend anyone or spread hate speech). However, I am concerned that they **misuse** - particularly with regard to the sources they use to collect information, namely private information - **the information they present** and that, as I said before, they evolve to such an extent that the concerns that are already being felt in the illustration market in China, for example, are reflected in their own way in the global translation market and in the creation of text in general (if that is not the case already). I **fear that there is a monopoly or duopoly of information** on the part of these systems. And I also don't like **the opacity with which ChatGPT presents information**, without informing about the sources (probably even private conversations). I think that, **in addition to the war in Ukraine, this topic in general** (not only applied to translators/text creators or people with other creative professions) **will be the big issue that will mark what remains of this decade**. I fear that in the next 5/10 years **intellectual-based work will be tremendously affected**. And as such, I agree with the petition that came out a couple of months ago to "freeze" AI systems development for six months.<br>**Disinformation** is also one of the **dangers of GNMT and ChatGPT**, especially with everything that this spread of disinformation entails. | Data safety / Confidentiality / Control of information / Intellectual based work |
| **Generalist systems** like Google NMT and DeepL **work in a generalist way**. I do not understand the insistence of certain agencies on using them. A **customised and trained MT system is too expensive** for most companies. I have a DeepL subscription, but I still **don't share sensitive or confidential data**. I like **ChatGPT as a "proofreader"** and I use it at a personal level for English and Spanish texts. It is not perfect, it does not dispense my clinical eye, but it **helps me in my writing**. We need to **form public opinion and encourage critical thinking**. An idiot who uses MT or ChatGPT will always be an idiot.<br>People are too dazzled by LLM, but few know that they are **powered by crowd workers, invisible and miserably paid humans who use MT in their tasks**. We are in a situation of garbage in, garbage out. **Without texts produced entirely by humans, LLMs collapse**. At the moment, there are **more risks than benefits**. | Data safety / Confidentiality / MT literacy / Labour exploitation |
| They **work best in close pairs** (PT-ES, for example) and **when English is the source language**. To translate from German, for example, it is far from producing acceptable results for any QA standard in translation. | MT quality |

| Respondents' comments | Topic |
|---|---|
| I do not use machine translation systems, but I believe that any **dependency on an automatic system is or can be harmful** to the **ability and dexterity of the human being**, as well as to their **flexibility of reasoning and communication**. | Cognitive human qualities |
| I do not use machine translation systems, but although I agree that there are **not many risks**, I think that there are **not many benefits** at the moment. Realistically, will it be so much more advantageous to translate something automatically and have a translator doing post-editing? The **translator will have to be twice as attentive when editing** as they do not know the extent of the system's capacity.<br>And **risk situations**, such as the crisis situation example given above, are **too important to accept these possibilities lightly**. In a crisis situation, more than in any other, it is **necessary to be clear and concise**. A **communication failure** due to a machine translation error **is not acceptable**. | MTPE / MT in crisis contexts |
| In my language, machine translation (MT) often follows an organic syntax similar to that of the original, which differs from the syntax that is written naturally when the text is originally written in that language. Over time, I think that the **language itself will lose its main characteristics**.<br>**Post-editing contradicts the brain's natural process of gestalt** that makes us accept imperfect information, insofar as it is understandable to us. This makes it more prone to **quality problems** and sometimes becomes **more tiring for the translator** than translation. | MT quality / MTPE |
| The **greatest risk** will be the **uninformed use**, either by those who impose these systems on translators or by the general public. There is a **lack of literacy about machine translation**, its advantages and disadvantages, without neglecting the **importance of the translator** and the need for **machine translation to be evaluated by a professional**. | MT literacy / Translators' role and status / MT quality |
| In some cases, **machine translation systems contribute positively to my work**, so I use them. However, I am **aware of the risks**. **Post-editing** work is **time consuming**, **confusing** and we end up with **lower quality texts** and **lower pay**. | MTPE / MT quality / Fees |

*Figure 70 - Respondents' comments on MT systems*

Summarising the main topics touched on by these comments, some of the respondents acknowledge the utility of good MT systems in enhancing time management. However, their reliability must be subject to thorough PE processes to ensure accuracy. There is also the acknowledgment of potential breakthroughs afforded by properly utilised MT systems, recognising them as valuable and practical tools in various domains. Other

respondents also emphasise that MT systems do not replace human translators but create new roles in PE and quality control, and that concerns about data protection risks associated with MT usage mirror those of other digital platforms processing sensitive information. Some express scepticism regarding the positive contributions of MT systems to the field of translation itself. Observations on the impact of increased MT usage highlight diminishing quality standards, as consumers become accustomed to lower-quality texts. This calls for research and training in MT literacy to mitigate potential risks. Critics point out the additional workload and time consumption associated with MTPE. They argue that the lack of confidentiality also fails to justify the use of MT systems. Moreover, there are concerns about the exacerbation of precariousness in translators' work. The opacity surrounding MT systems and unclear processes regarding user data processing further complicate matters. Besides these concerns, there is speculation on the significance of MT in shaping future global issues, alongside current events such as the war in Ukraine. Some comments suggest meaningful impacts on intellectual-based work in the coming years and identify disinformation as a potential danger associated with systems like Google Neural Machine Translation (GNMT) and ChatGPT.

#### *4.1.4.13 Key findings on ethical concerns about MT*

In summary, the ethical concerns raised in the survey can be ranked according to the respondents' classification of each sentence included in this section. The resulting list, ordered from most to least important, is as follows: (1) Bias in MT; (2) Copyright/Authorship of MT training data and of MT outputs; (3) Translator role and status; (4) MT in crisis contexts; (5) MT systems ecological footprint; (6) Quality of translations; (7) Confidentiality of data; (8) Data protection.

These concerns were also reflected in the comments provided by the respondents in the final open-ended questions of the survey. Other issues raised included the importance of machine translation literacy, worries about potential disinformation risks, the prospect of humans being replaced by machines, and the decline in cognitive human abilities.

In this part of the survey, no clear comparisons could be made with the previous studies mentioned in section 2.3.3, since none of those studies focus on the ethical concerns related to MT.

### 4.1.5 ChatGPT

In this section, there was a question concerning ChatGPT, considering its growing significance and prominence and the fact that, at the time of the survey, ChatGPT was the only generative AI model that was in broad use.

#### *4.1.5.1 Knowledge and usage of ChatGPT*

The objective of this question was to ascertain whether professional translators were acquainted with this generative AI model and employed it within the realm of their profession. The inquiry was as follows:

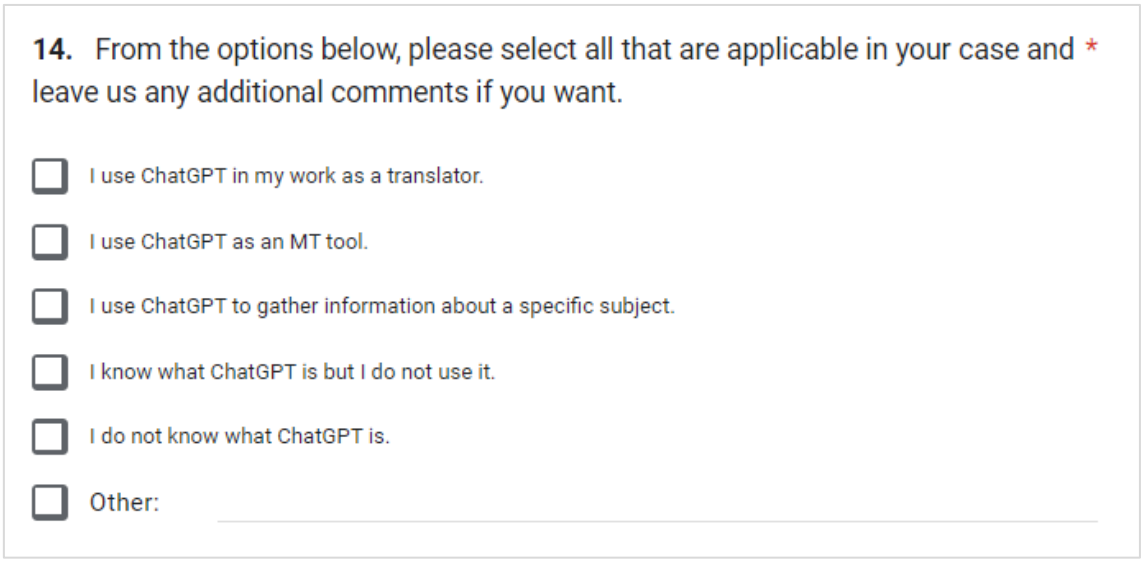



*Figure 71 - Survey question #14*

In our analysis, the responses were contrasted with the translators' years of professional experience, as depicted in Figure 72 below. A sizable portion, comprising 19 translators, was aware of ChatGPT, albeit not actively utilising it. Within this group, 11 participants possessed over 10 years of translation experience, while the remaining eight were fairly evenly distributed across the 6 to 10 years, 3 to 5 years, 1 to 2 years, and less than one year of experience categories. The second-largest cohort, consisting of nine respondents, acknowledged using ChatGPT to gather information on specific topics, with five of them having more than a decade of experience in the translation profession. It is

noteworthy that only four out of the 32 respondents indicated using ChatGPT in their translation work, and a mere three employed it as an MT tool.

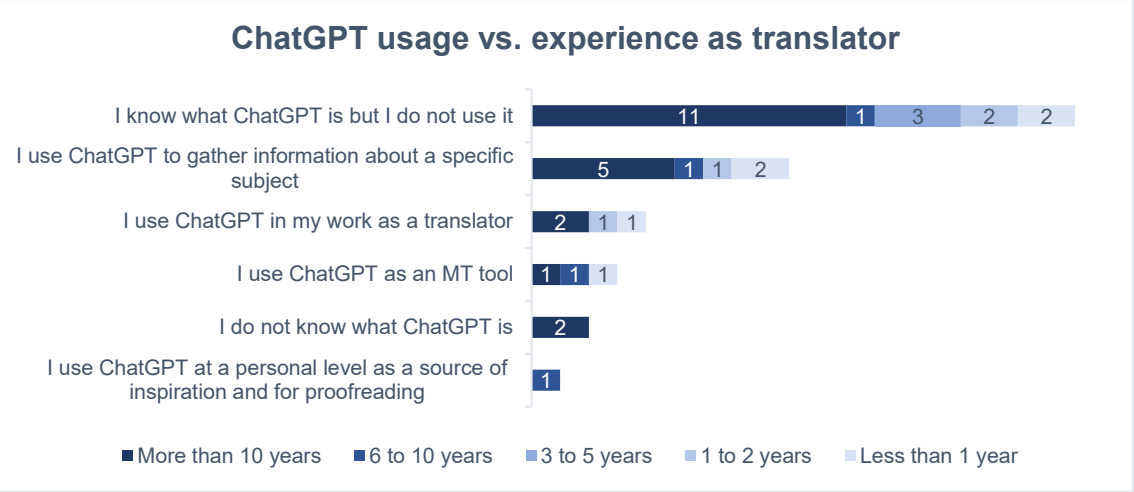



*Figure 72 - ChatGPT usage vs. experience as translator*

Another comparison was conducted regarding the usage of MT. As depicted in Figure 73 below, all respondents who claimed not to use MT are aware of ChatGPT. Seven of them do not utilise it, while from the remaining two, one employs it to gather information about specific subjects, and the other utilises it as an MT tool, which is intriguing considering their declaration of not using any MT system. However, the majority still favours MT systems over ChatGPT as MT tools, reserving the use of this generative AI model for various purposes, some related to their work as translators.

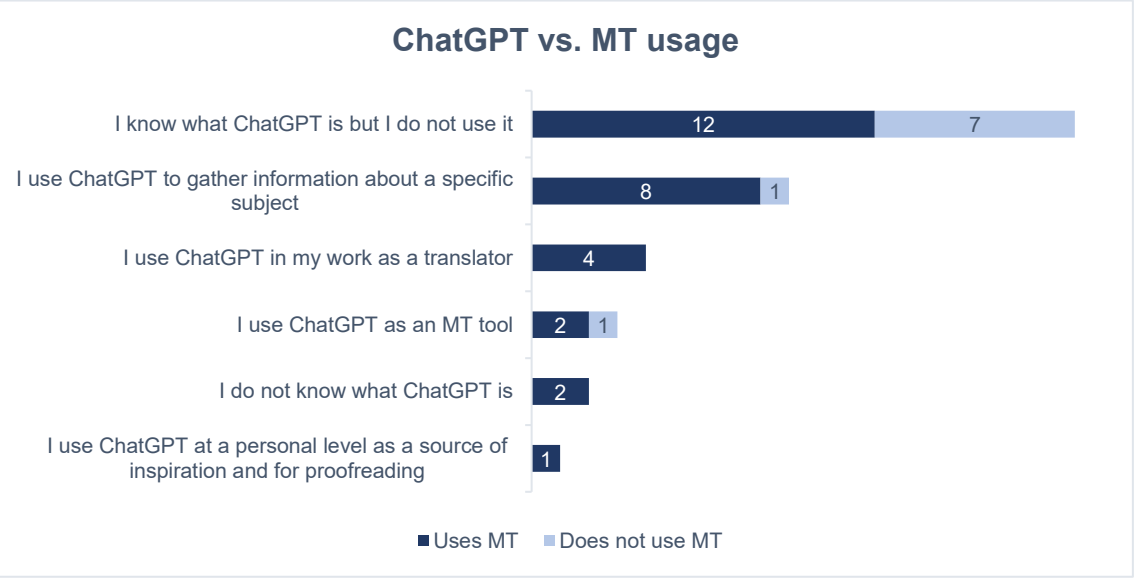



*Figure 73 - ChatGPT vs. MT usage*

#### *4.1.5.2 Key findings on respondents' knowledge and usage of ChatGPT*

Generally speaking, the majority of respondents reported the following:

- Irrespective of their experience as translators and their use of MT in their work, they claimed awareness of ChatGPT even if they do not utilise it.
- The second-largest group of respondents mentioned using ChatGPT to gather information on specific subjects.
- Only a minority stated they employed ChatGPT for their translation tasks.

In the next section of this chapter, there is a comparison between the most relevant results of the Portuguese and Finnish surveys, providing further insights into the perceptions and usage patterns of MT systems in different linguistic contexts.

## 4.2 Comparison between Portuguese and Finnish results

### 4.2.1 Respondents' profile

The majority of respondents from Portugal and Finland are nationals of their respective countries and have Portugal and Finland as their country of residence. However, there are some differences regarding their working languages that are worth noting:

| | PT | FI |
|---|---|---|
| **Number of working languages** | 9 | 17 |
| **Top 4 languages** | PT, EN, ES, FR | FI, EN, SV, DE |

*Figure 74 - Comparison between PT and FI working languages*

In terms of the number of working languages, there is a greater variety which is evident in the Finnish survey when compared to the Portuguese one (9 languages in the Portuguese case and 17 languages in the Finnish case). Regarding the most commonly used languages, Portuguese/Finnish and English dominate the list. As expected, Latin or Romance languages follow suit in the case of Portugal, while Germanic languages are prominent in the Finnish context.

When examining the types of clients, the majority of both Portuguese and Finnish respondents work for agencies/LSPs. Corporate clients rank second in both surveys. However, there is a notable difference in the inclusion of individual clients: Portuguese translators show a greater tendency to work with individual clients (it is the second most popular choice in the Portuguese survey), while Finns have less inclination towards this option (it only appears in fifth place for Finland).

Other parameters such as "years of experience as a translator," "working markets," and "CAT tools usage" yield similar results across both the Portuguese and Finnish surveys.

### 4.2.2 Respondents' knowledge and use of MT

In this section of the survey, certain results deserve comparison due to considerable differences that offer interesting insights. One such comparison relates to the sources of information for acquiring knowledge about MT. Self-learning emerges as the primary source in both countries, yet a considerable disparity exists regarding the role of universities. In Portugal, universities rank as the second most common source of information for MT, whereas in Finland, they are the least mentioned source, with other institutions such as training centres or LSPs occupying the second position. This could be attributed to variances in the syllabus of Portuguese and Finnish university courses, or to the timing when such topics began to be addressed in university seminars.

However, conducting a more comprehensive investigation is warranted to understand the underlying reasons for these differences in results.

Regarding the number of years of MT usage, both countries exhibit a similar distribution, although with some noteworthy discrepancies. The "less than 1 year" category comprises only 4.2% of Portuguese respondents, compared to 20.5% in Finland. Conversely, the "1 to 2 years" category accounts for 41.7% of Portuguese respondents and only 25.6% of Finnish respondents. Since there are no major differences between the years of experience as translators for Portuguese and Finnish respondents, further investigation would be needed to understand the reasons behind these discrepancies.

Another interesting comparison lies in the MT models used by respondents from both countries. Among all MT models, NMT emerges as the most widely used in both contexts. However, Finnish respondents appear to be less informed about the specific MT model they are using, as evidenced by the "Does not know" category being the most commonly selected option among them (56.4%), compared to only 29.2% for Portuguese respondents. The variation could be explained by a higher percentage of Portuguese respondents gaining knowledge about MT through university seminars. This suggests a more structured and theoretical study of the subject. Conversely, for Finnish respondents, their knowledge of MT systems may be more practical, acquired through self-learning or training courses, preparing them for using the technology rather than delving into its underlying mechanisms. However, further research is necessary to fully comprehend the difference in results.

In comparing the way respondents access MT systems (through the use of free or paid online platforms, of tools integrated into their CAT systems or others), similarities exist between Portuguese and Finnish respondents. However, a notable difference arises in the preference for customised systems (client-owned systems), which ranks as the most chosen option among Finnish respondents but comes third among Portuguese respondents. This difference may be attributed to the higher proportion of Finnish respondents working for corporate clients, who likely possess more robust technological infrastructure and, consequently, customised MT systems.

Moving on to the comparison between the respondents' areas of work and the areas where MT is used, noteworthy differences emerge. Overall, the percentages of MT usage in each area are higher in the Finnish data, with the lowest percentage being 42.9% compared to 33.3% in the Portuguese data. Major disparities also exist in the areas where MT is predominantly used. Among the Portuguese respondents, the top area is

Life Sciences, whereas in the Finnish case, it is Gaming, with Life Sciences being the area where MT is least used. Additionally, the positioning of Economy/Finance differs, ranking as the third least used area for Portuguese respondents but the fourth most used for the Finnish ones.

### 4.2.3 The impact of MT in the respondents' work

When asked to rate the impact of MT on their work, using a Likert scale across seven topics, respondents from the Portuguese and Finnish surveys generally shared similar opinions. However, there were some differences in the areas concerning payment, quality, and training needs. Most Portuguese survey respondents reported feeling no substantial change in these aspects, whereas Finnish survey respondents indicated a decrease in payments and quality, alongside an increase in training needs.

| Topics | PT main trend | FI main trend |
|---|---|---|
| **The payment you receive** | No decrease or increase | Decrease |
| **The quality of your work** | No decrease or increase | Decrease |
| **Your use of technology (e.g.: CAT, productivity tools)** | Increase | Increase |
| **Your training needs** | No decrease or increase | Increase |
| **Your translation speed** | Increase | Increase |
| **The volume of post-editing work you receive** | Increase | Increase |
| **The volume of translation work you receive** | Decrease | Decrease |

*Figure 75 - Comparison between PT and FI data on impact of MT in respondents' work*

### 4.2.4 Ethical concerns

In the concluding section of the survey, respondents were requested to rate their level of agreement or disagreement with nine statements reflecting ethical concerns, using a Likert scale. Figure 76 displays the opinions of respondents from the Portuguese and Finnish surveys. Interestingly, there is complete alignment of opinions between both participants, as illustrated in the figure.

| Ethical concern | Statement | PT main trend | FI main trend |
|---|---|---|---|
| **Copyright / authorship** | I am comfortable with the fact that translators' work is used without their knowledge to train MT systems. | Disagree | Disagree |

| Ethical concern | Statement | PT main trend | FI main trend |
|---|---|---|---|
| **Copyright / authorship** | I think it is OK for a translator to claim full authorship of a translation when it is the result of MT and post-editing | Agree | Agree |
| **Translator / post-editor status** | Working as a post-editor of MT requires the same level of expertise as working as a translator without MT, and the same value should be placed on both | Agree | Agree |
| **Bias** | I frequently find traces of gender, racial and/or ethnic bias in raw MT outputs | Agree | Agree |
| **Quality** | In my opinion, the quality of a post-edited MT output is equivalent to the quality of a target text translated without the use of MT | Disagree | Disagree |
| **Data protection** | I believe that MT systems have automated mechanisms to guarantee the protection of personal data included in texts used to train those systems | Disagree | Disagree |
| **Confidentiality** | I am sure that my clients' sensitive and confidential information is duly protected when I use MT systems on their projects | Disagree / Do not know | Disagree |
| **Crisis contexts** | In my opinion it is OK to use MT systems in crisis contexts that demand fast translations in different language pairs, even though raw MT outputs might have some errors or inconsistencies | Agree | Agree |
| **Ecological footprint** | Although the training of MT engines has a high environmental impact due to the demanding power needs of the servers used to process large amounts of data, the advantages they bring greatly surpass their ecological footprint | Disagree | Disagree |

*Figure 76 - Comparison between PT and FI data on ethical concerns*

### 4.2.5 ChatGPT

In this section of the survey, the major differences between the Portuguese and Finnish results are shown in Figure 77 below:

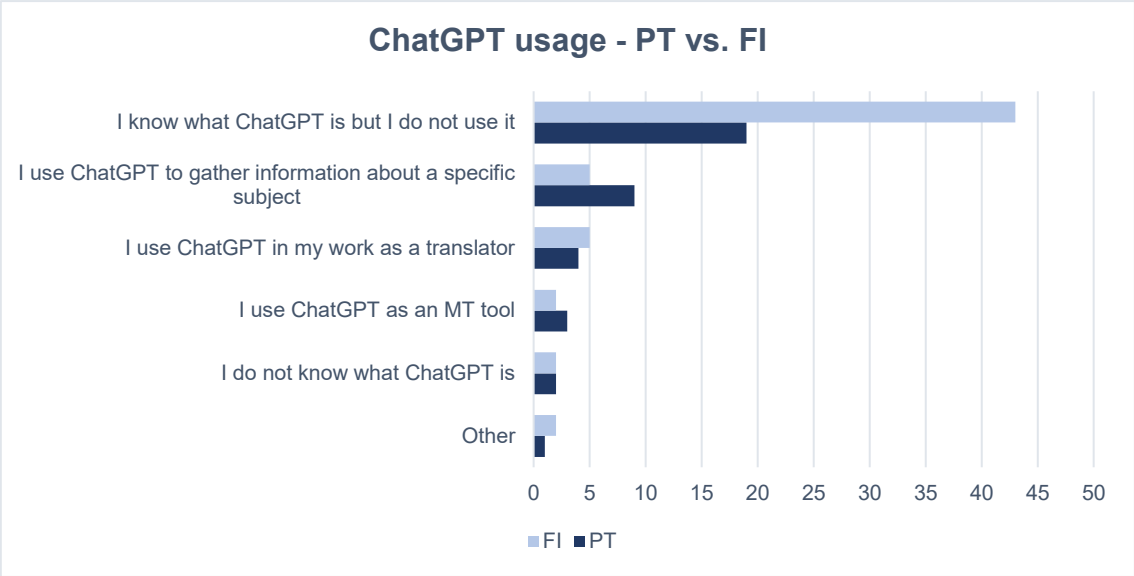



*Figure 77 - ChatGPT usage - PT vs. FI*

Whereas 59.4% of the Portuguese respondents know ChatGPT but do not use it, this is the case for 81.1% of the Finnish translators. From the remaining respondents, a larger percentage of Portuguese translators use ChatGPT either as a general tool or as a tool for their translation work (53.1% vs. only 22.6% of the Finnish translators).

### 4.2.6 Key findings on the comparison between Portuguese and Finnish results

The most relevant findings from this comparison can be summarised as follows:

- The respondents' profiles are similar, consisting of translators from Portugal and Finland, with Portuguese/Finnish and English as their main working languages. Both groups primarily work for agencies/LSPs, with corporate clients ranking second in both surveys. The main difference is that individual clients are more common for Portuguese than for Finnish translators.
- The main source of MT information is self-learning in both cases, but there is a difference in the role of universities. In Portugal, universities are the second most common source of information, while in Finland, they are the least chosen option. This difference might be due to variations in university syllabuses or the timing of introducing these topics in curricula. NMT is the most widely used model, but a large

percentage of Finnish respondents do not know which model they use, compared to a much smaller number of Portuguese respondents. This could be because more Portuguese respondents acquire MT knowledge in universities, giving them a stronger theoretical background.

- Both Portuguese and Finnish respondents access free online MT systems, but more Finnish respondents use client-owned MT systems, probably because more Portuguese translators work for individual clients who are less likely to have their own MT systems.
- There are slight differences in the areas where MT is used between Portuguese and Finnish respondents, with a higher percentage of MT usage in all areas among Finnish respondents.
- Regarding the impact of MT on translators' work, Finnish respondents reported feeling an increase or decrease in all areas included in the survey, while Portuguese respondents reported no impact in the areas of payment, quality, and training needs.
- Concerning ethical questions listed in the survey, both Portuguese and Finnish respondents expressed the same opinions, showing complete alignment in their answers.
- Lastly, the percentage of Portuguese translators using ChatGPT is higher than that of Finnish translators, and among those using this tool, more Portuguese translators use it for translation-related purposes.

# 5. Conclusions

At a time when AI permeates many aspects of our lives and the world is undergoing important transformations as a result of this technology, translation has not been excluded. In fact, it is among the earliest fields to experience the impact of AI, and in a significant manner. As Mohamed *et al.* (2024) asserted, NMT is leading this transformative process, pushing translation accuracy to unprecedented levels on what concerns context, nuances, and idiomatic expressions. With MT systems' rapid advancement and continual refinement, translators and the market have had little time to adjust and adapt to this new reality. Consequently, translators find themselves navigating this terrain without a clear set of consistent rules for ethically and responsibly utilising this tool. Moreover, research into the ethical dimensions of translators' awareness and knowledge regarding MT systems appears to be extremely limited, based on the available investigations. Thus, amidst the hype surrounding the topic, the present work aimed to address the following queries:

1. To what extent are translators familiar with MT?
2. What are the perceived implications of MT on the translators' professional activities?
3. How aware are translators of MT ethical implications?

To achieve this goal, a survey was designed and applied to a cohort of professional translators. Collaborating with a colleague from Tampere University, who is working on a mirror thesis, the survey gathered responses from professionals who worked with Portuguese and/or Finnish as one of their working languages, totalling 85 participants (32 from the Portuguese survey and 53 from the Finnish survey). As mentioned earlier, although this number is fairly small and not representative of the whole population of Portuguese or Finnish translators, it was considered reliable enough to analyse and draw meaningful conclusions.

## 5.1 Key findings

From the comprehensive analysis of the Portuguese data, complemented by the comparison with the Finnish results, the main conclusions are summarised below, grouped according to the core sections of the survey:

*Knowledge and use of MT*

- Translators' knowledge about MT systems is limited and primarily acquired through self-learning.

- Most translators use MT, mainly in technical areas, but they have only started using it recently and access it through free online systems.
- Their motivation to use MT is mainly driven by the belief that it helps them in their work, although they use it with apprehension and do not inform their clients about this usage.

*Impact of MT in respondents' work*

- Translators perceive payments and the volume of translation work as the areas most negatively affected by MT.
- Positive impacts are observed in areas such as the use of technology, translation speed, and the volume of post-editing work.
- Overall, there is a negative sentiment towards MT, primarily due to concerns about fees, the replacement of human translators by machines, and the degradation of translation quality.
- Only a minority recognise the benefits and potential of this technology.

*Ethical concerns about MT*

- The primary concerns chosen by translators from the ones listed in the survey questions include: (1) Bias in MT; (2) Copyright/Authorship of MT training data and of MT outputs; (3) Translator role and status.
- Additionally, translators voiced other concerns in open-ended questions, including the importance of machine translation literacy, apprehensions about potential disinformation risks, the potential replacement of humans by machines, and the decline in cognitive human abilities.

In a more global note, the prevailing lack of knowledge about MT and AI, stemming from the primary source of information being self-learning rather than structured courses at universities or training centres, likely contributes to the prevalent negativity and fear surrounding these technologies. Therefore, investing in training is crucial to promote MT literacy, with both universities and LSPs playing vital roles in this endeavour. Additionally, support from translators' associations and other stakeholders is essential to emphasise the importance of translators as linguistic experts and to develop codes of ethics with specific guidelines on MT usage.

## 5.2 Limitations of the study

While the survey rendered meaningful conclusions, certain limitations are worth of notice and, if addressed, could enhance the validity of future research:

- Translators in Portugal displayed low engagement in participating in surveys of this nature, potentially impacting the sample size and representation.
- The timing of the survey launch may not have been optimal. Conducting the survey during summer months, when fewer professionals are working, could have affected participation rates.
- Limited personal social network activity may have constrained the ability to attract more participants through those channels. Increasing activity and creativity on social networks could potentially broaden the reach of future surveys.
- Discrepancies in university calendars between Portugal and Finland, coupled with geographical distance from the colleague in Tampere, imposed limitations on the comparative analysis of the surveys.

## 5.3 Future directions

Based on the findings presented in section 5.1 above, my proposal would be to further develop work in two distinct paths within this topic:

### 5.3.1 Stimulating MT and AI Literacy among Translators

First and most important, there is the need to stimulate a combined effort to boost MT and AI literacy among professional translators and translation students, as well as to empower and recognise their role and status. To achieve this, collaboration among all stakeholders, including universities, translation agencies/LSPs, professional translators' associations and technology developers, would be essential. Each of these entities should incorporate the concerns and requirements expressed by translators into their respective domains of expertise. They could contribute, among other things, with quality training at university and post-university level, as well as with a set of guidelines or code of ethics that could increase translators' acceptance and confidence towards this technology and improve the quality of the work in general.

Two of the concrete measures that could be taken in this scope would be:

- Professional translators' associations to design a code of ethics (or include specific guidelines in the existing ones) with a focus on MT and on the specific ethical

requirements of translation and PE when using this technology (see also Pérez Macías, 2020);

- Universities, in association with MT developers and LSPs, to design a training program that would grant a certification as MT expert, which would be included in the Universities' syllabus, allowing translators to present themselves as certified MT systems professionals. This would contribute to improve the quality of MT post-edited translations and enhance the status of the translators as key actors in this ecosystem. This training program would also be available for professional translators to attend so as to update their knowledge on the subject and give them the expertise they need to use this tool in a responsible and ethical manner, confidently and without fear.

### 5.3.2 Further Research in MT Acceptance and Usage

Continued research is needed to monitor and evaluate the evolution of MT acceptance and usage among professional translators. Actions could include:

- Deepening the comparison between Finnish and Portuguese surveys to validate initial observations and draw comprehensive conclusions.
- Expanding the survey to gather responses from additional countries to provide a more diverse sample of translators, confirming and enriching the findings of the current study.
- Setting up a short follow-up survey to periodically monitor the level of awareness, acceptance, and knowledge of MT systems among translators. Launching this survey every six months would help evaluate how the situation is evolving and allow for necessary measures to improve it.

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# Annexes

# I. Survey sample – Portuguese Version[10]

## Introduction

# Tradução Automática e questões éticas da Inteligência Artificial

Este inquérito é o resultado da cooperação entre uma estudante da Universidade de Tampere, na Finlândia, e uma estudante da Faculdade de Letras da Universidade de Lisboa, em Portugal, sendo realizado no âmbito das suas teses de Mestrado em Tradução.

Destina-se a todos os tradutores profissionais, independentemente da área de especialização, desde que as suas línguas de trabalho incluam o português europeu e/ou o finlandês.

Os resultados do inquérito conduzirão a uma análise comparativa e à identificação de elementos comuns e discrepâncias entre os profissionais que trabalham com estas duas línguas quanto ao seu conhecimento sobre tradução automática, ao impacto que esta tecnologia tem no seu trabalho e à noção que têm sobre as respetivas implicações éticas.

A Inteligência Artificial (IA ) e a tradução automática estão a transformar a indústria da tradução. Com os avanços da tecnologia, é possível, hoje em dia, traduzir em segundos um texto fonte para uma língua de destino, estando esta capacidade acessível a qualquer indivíduo que disponha de um computador e uma ligação à internet. A utilização de sistemas de tradução automática tem vindo a aumentar, quer pelo público em geral, como forma de ler rapidamente textos escritos em línguas estrangeiras, quer pelos tradutores profissionais, como forma de acelerar o seu trabalho. No entanto, a utilização generalizada destes sistemas levanta questões éticas que afetam todos os intervenientes no processo, desde as empresas e engenheiros que constroem os sistemas, até ao público em geral, passando pelos tradutores profissionais. É o impacto sentido por este último grupo que pretendemos avaliar com o estudo, tendo como objetivo promover o trabalho destes profissionais e analisar os desafios éticos em jogo.

Agradecemos à APT - Associação Portuguesa de Tradutores, o apoio na distribuição do inquérito através dos seus associados.

De igual modo, agradecemos a sua participação e contribuição que deverá demorar entre 15 e 25 minutos.

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*Na página seguinte encontrará mais informação acerca do estudo e uma Declaração de Consentimento Informado. Pedimos-lhe que a leia e expresse o seu acordo em relação ao respetivo conteúdo, de modo a iniciar a resposta ao inquérito.*

[10] The Portuguese version of the survey is presented on this and the following pages. The English version is included earlier in the text, in section 4.1 — Portuguese survey results, with all questions shown before the presentation and analysis of their results.

## Informed Consent

### Consentimento Informado

**Objetivo do estudo:** Analisar de forma comparativa o grau de conhecimento que os tradutores profissionais em Portugal e na Finlândia têm sobre os Sistemas de Tradução Automática e a sua consciência sobre as implicações éticas da utilização destes sistemas.

**Descrição e métodos:** A participação neste estudo implica o preenchimento de um questionário online por parte dos inquiridos. O questionário será enviado para tradutores profissionais cujas línguas de trabalho incluam o português e/ou o finlandês. Após a recepção dos questionários preenchidos, será realizada uma análise comparativa dos dados portugueses e finlandeses. Os resultados expectáveis poderão contribuir com orientações para uma maior consciencialização por parte dos tradutores dos desafios éticos dos sistemas de tradução automática e, pela relevância do tema, serão também incluídos numa *mirroring thesis* que está a ser desenvolvida na Universidade de Tampere, na Finlândia.

**Riscos previsíveis:** Não aplicável.

**Possíveis benefícios para os participantes:** Não se garante que este estudo proporcione benefícios diretos para o participante. No entanto, a informação obtida vai contribuir para aumentar o conhecimento científico sobre os desafios éticos relacionados com o uso de Sistemas de Tradução Automática no contexto da rápida evolução tecnológica na área da Inteligência Artificial e poderá, indiretamente, vir a beneficiar terceiros. O participante não terá quaisquer benefícios financeiros decorrentes deste estudo.

**Participação voluntária:** O participante terá toda a liberdade para recusar a participação no estudo ou retirar o seu consentimento, suspendendo a participação em qualquer momento. A participação é voluntária e a recusa em participar não acarreta qualquer penalização ou perda de benefícios.

**Confidencialidade:** Os dados obtidos serão utilizados exclusivamente para investigação. A informação recolhida de cada participante será combinada e analisada em conjunto com informação de outros participantes. Todos os dados de identificação de cada participante serão mantidos em confidencialidade. Para o estudo, a cada participante será atribuído um número codificado. A identidade dos participantes nunca será revelada em qualquer relatório ou publicação decorrente do estudo.

**A quem devo colocar questões relacionadas com este estudo:** Professora Helena Gorete Silva Moniz, helena.moniz@campus.ul.pt (professora responsável); Clara Nisa Caetano Pereira de Almeida e Paiva, clarapaiva@edu.ulisboa.pt (investigadora responsável).

**Declaration of Informed Consent**

DECLARAÇÃO DE CONSENTIMENTO INFORMADO *

Declaro ter tomado conhecimento e aceitar participar, voluntariamente, num estudo que tem por objetivo analisar de forma comparativa o grau de conhecimento que os tradutores profissionais em Portugal e na Finlândia têm sobre sistemas de tradução automática e a sua consciência sobre as implicações éticas da utilização destes sistemas. Para esse efeito, aceito responder ao questionário acima mencionado.

Autorizo que os dados obtidos sejam armazenados numa pasta da Google Drive criada especificamente para o efeito, usando a conta Google clarapaiva@edu.ulisboa.pt a que apenas a requerente e as coordenadoras da dissertação terão acesso, de acordo com legislação em vigor, podendo apenas ser utilizados para o estudo acima. Poderei, no entanto, revogar a autorização para utilização dos meus dados em qualquer momento.

Declaro ainda que os resultados dos estudos realizados com os meus dados poderão ser usados em comunicações e publicações científicas de forma anónima.

O estudo proposto foi-me claramente explicado e tive oportunidade de colocar questões. Receberei uma cópia desta declaração juntamente com todas as minhas respostas e este inquérito.

- ○ Confirmo e concordo com o conteúdo desta Declaração de Consentimento Informado e responderei de seguida às perguntas incluídas neste inquérito.
- ○ Não confirmo e discordo do conteúdo desta Declaração de Consentimento Informado, terminando aqui a minha participação neste estudo.

## Section #1 – Knowledge and use of MT

### Conhecimento e utilização de sistemas de tradução automática

A tradução automática, que têm por base a utilização de IA e de complexos sistemas de redes neuronais, permite aos utilizadores introduzir um texto fonte num determinado idioma, obtendo um resultado noutro idioma numa questão de segundos. Para tal, podem ser usados sistemas *on-line*, gratuitos ou pagos, ou integrados em ferramentas de Tradução Assistida por Computador (TAC). O resultado é então sujeito a um trabalho de pós-edição humana, por forma a obter um texto final, pronto para entrega ao cliente. Este é o que podemos chamar de processo típico utilizado para a tradução de um texto usando tradução automática. É à luz desta tecnologia e processo que gostaríamos que respondesse às perguntas desta secção.

**1.** Selecionando uma das opções da escala, indique qual o seu grau de familiaridade com a tecnologia usada nos sistemas de tradução automática. *

| | Nenhum conhecimento | Pouco conhecimento | Algum conhecimento | Bastante conhecimento | Conhecimento profundo |
|---|---|---|---|---|---|
| Opções | ◯ | ◯ | ◯ | ◯ | ◯ |

**2.** Caso tenha algum conhecimento sobre estes sistemas, de que modo o obteve (selecione todas as opções aplicáveis)?

- ☐ Num seminário integrado num curso universitário
- ☐ Num curso de formação ministrado por outra instituição (por exemplo, empresa fornecedora de serviços linguísticos, centro de formação, etc.)
- ☐ Através de autoaprendizagem (webinars e outros materiais disponíveis on-line)
- ☐ Outra: _____

**3.** Utiliza tradução automática no seu trabalho como tradutor profissional (se selecionar "sim" continuará para a secção seguinte; se selecionar "não" passará para a pergunta #14 do questionário)? *

- ◯ Sim
- ◯ Não

## Conhecimento e utilização de sistemas de tradução automática (continuação)

**4.** Há quanto tempo utiliza tradução automática? *

- ◯ Há menos de 1 ano
- ◯ 1 a 2 anos
- ◯ 3 a 5 anos
- ◯ 6 a 8 anos
- ◯ Há mais de 8 anos

**5.** Que modelos utilizou até agora (selecione todas as opções aplicáveis)? *

- ☐ Modelos de deep learning (tradução automática baseada em redes neurais — NMT)
- ☐ Modelos híbridos (tradução automática híbrida — HMT)
- ☐ Modelos estatísticos (tradução automática estatística — SMT)
- ☐ Modelos baseados em regras (tradução automática baseada em regras — RBMT)
- ☐ Não sei

**6.** Que tipo de sistemas de tradução automática utiliza (selecione todas as opções aplicáveis)? *

- ☐ Sistemas on-line gratuitos
- ☐ Sistemas on-line pagos
- ☐ Sistemas gratuitos integrados na minha ferramenta de tradução assistida por computador
- ☐ Sistemas pagos integrados na minha ferramenta de tradução assistida por computador
- ☐ Sistemas personalizados (sistemas próprios dos meus clientes)
- ☐ O meu sistema, que eu próprio construí e mantenho atualizado
- ☐ Outra: _____

**7.** Da lista abaixo, selecione todas as áreas em que trabalha como tradutor e dessas, aquelas em que utiliza tradução automática (selecione todas as opções aplicáveis).

| | Traduzo textos desta área | Utilizo tradução automática para traduzir textos desta área |
|---|---|---|
| Audiovisual | ☐ | ☐ |
| Ciências da vida | ☐ | ☐ |
| Economia/finanças | ☐ | ☐ |
| Jogos | ☐ | ☐ |
| Jurídica | ☐ | ☐ |
| Literatura | ☐ | ☐ |
| Localização de software | ☐ | ☐ |
| Marketing/Publicidade | ☐ | ☐ |
| Técnica | ☐ | ☐ |
| Websites/localização multimédia | ☐ | ☐ |
| Outra | ☐ | ☐ |

**8.** Se selecionou "Outra" na pergunta #7, indique a que outras áreas se refere.

A sua resposta

**9.** Porque razão utiliza tradução automática? *

- ◯ Apenas porque os meus clientes me pedem para o fazer, apesar de não acreditar que isso me ajude no meu trabalho.
- ◯ Porque os meus clientes me pedem para o fazer e porque acredito que isso me ajuda no meu trabalho.
- ◯ Porque acredito que isso me ajuda no meu trabalho, apesar de os meus clientes não me pedirem expressamente para o fazer.
- ◯ Outra: _____

**10.** Quando utiliza tradução automática sem que seja por exigência dos seus clientes, com que frequência os informa de que utiliza essa tecnologia nos seus trabalhos de tradução?

- ◯ Sempre
- ◯ Quase sempre
- ◯ Raramente
- ◯ Nunca

**11.** Já contribuiu consciente e deliberadamente para a criação ou melhoria de um * sistema de tradução automática?

- ◯ Sim
- ◯ Não

**12.** Se respondeu «sim» à pergunta #11, para que sistema contribuiu?

A sua resposta

**13.** Qual foi a sua contribuição (selecione todas as opções aplicáveis)?

- [ ] Dados de treino (texto-fonte e texto traduzido correspondente na língua de destino)
- [ ] Dados de treino (texto monolingue)
- [ ] Avaliação da qualidade dos resultados da tradução automática
- [ ] Outra:

## Section #2 – ChatGPT

### ChatGPT

Tendo em conta os últimos desenvolvimentos em torno do ChatGPT, bem como a sua crescente disponibilidade e facilidade de uso, gostaríamos de aproveitar esta oportunidade para recolher algumas informações sobre este sistema.

**14.** Das opções indicadas abaixo, selecione todas as que são aplicáveis e, caso pretenda, deixe-nos os seus comentários sobre o tema. *

- [ ] Uso o ChatGPT no meu trabalho como tradutor.
- [ ] Uso o ChatGPT como uma ferramenta de tradução automática.
- [ ] Uso o ChatGPT para obter informações sobre um assunto específico.
- [ ] Sei o que é o ChatGPT mas não o uso.
- [ ] Não sei o que é o ChatGPT.
- [ ] Outra: _____

## Section #3 – The impact of MT in Translators' work

### O impacto da tradução automática no seu trabalho

Dada a disponibilidade, a facilidade de utilização e a rapidez de resposta dos sistemas de tradução automática, esta tecnologia está a ter um impacto crescente no setor da tradução. Nesta secção, gostaríamos de saber de que forma a tradução automática está a alterar as suas necessidades e a sua forma de trabalhar.

**15.** Indique qual o impacto que, na sua opinião, a tradução automática está a ter/terá no seu trabalho enquanto tradutor, no que diz respeito aos tópicos a seguir enumerados. *

| | Grande decréscimo | Ligeiro decréscimo | Nem decréscimo nem acréscimo | Ligeiro acréscimo | Grande acréscimo | Não sei |
|---|---|---|---|---|---|---|
| Os honorários que recebe | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| A qualidade do seu trabalho | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| A sua utilização de tecnologia (por ex.: ferramentas de TAC, produtividade, etc) | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| As suas necessidades de formação | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| A rapidez com que traduz | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| O volume de trabalho de pós-edição que recebe | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| O volume de trabalho de tradução que recebe | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**16.** Caso pretenda, indique outros aspetos em que acredita que a tradução automática está a ter/terá um impacto positivo ou negativo no seu trabalho enquanto tradutor e diga-nos porquê.

A sua resposta

## Section #4 – Ethical Concerns

### Preocupações éticas

As próximas perguntas dizem respeito a questões éticas relacionadas com a tradução automática. Nesta secção, gostaríamos de saber qual a sua opinião acerca dessas questões.

Deste modo, indique-nos se concorda ou discorda das seguintes afirmações, selecionando uma opção na escala correspondente. Caso não tenha opinião sobre o assunto em questão, escolha a opção «Não sei».

**17.** Sinto-me à vontade com o facto do trabalho dos tradutores ser usado sem o seu conhecimento para treinar sistemas de tradução automática. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**18.** Parece-me bem que um tradutor reivindique a autoria integral de uma tradução realizada através da pós-edição de um resultado de tradução automática. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**19.** Trabalhar como pós-editor de tradução automática requer o mesmo nível de especialização e competência que trabalhar como tradutor sem recurso a tradução automática, devendo o mesmo valor ser atribuído a ambos os trabalhos. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**20.** Encontro frequentemente sinais de enviesamento de género, racial e/ou étnico em resultados de tradução automática. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**21.** Na minha opinião, a qualidade de um resultado de tradução automática pós-editado é equivalente à qualidade de um texto-alvo traduzido sem o recurso a tradução automática. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**22.** Acredito que os sistemas de tradução automática dispõem de mecanismos automatizados para garantir a proteção dos dados pessoais incluídos nos textos utilizados para treinar esses sistemas. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**23.** Estou certo de que as informações confidenciais e sensíveis dos meus clientes estão devidamente protegidas quando uso sistemas de tradução automática nos seus projetos. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**24.** Na minha opinião, a utilização de sistemas de tradução automática em contextos de crise que exigem traduções rápidas em diferentes pares de idiomas é vantajosa, mesmo que os resultados possam ter alguns erros ou inconsistências. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**25.** Embora o treino de sistemas de tradução automática tenha um elevado impacto ambiental devido às exigentes necessidades de energia dos servidores usados para processar grandes quantidades de dados, as vantagens que esses sistemas nos trazem superam significativamente sua pegada ecológica. *

| | Discordo totalmente | Discordo | Discordo parcialmente | Não discordo nem concordo | Concordo parcialmente | Concordo | Concordo totalmente | Não sei |
|---|---|---|---|---|---|---|---|---|
| Opinião | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**26.** Se desejar, enumere outras questões éticas que considere que devem ser abordadas e não estão incluídas em nenhuma das perguntas acima referidas.

A sua resposta

**27**. Independentemente do modo como utiliza estes sistemas, deixe-nos sua opinião sobre a forma como funcionam, a confiança que merecem e/ou os benefícios e/ou riscos que representam para a sociedade.

A sua resposta

## Section #5 – Translators' Background

### O seu perfil

A fim de caracterizar da melhor forma o público-alvo deste inquérito, gostaríamos de recolher alguns dados sobre o seu perfil. Estas informações, bem como todos os outros dados recolhidos, serão agregadas e, por conseguinte, não será possível identificar qualquer resposta individual. Além disso, de acordo com as disposições da legislação em vigor sobre Proteção de Dados Pessoais, os dados destinam-se, única e exclusivamente, à finalidade definida no âmbito desta pesquisa, sendo a respetiva confidencialidade garantida e nenhuma informação compartilhada com terceiros.

**28.** Nacionalidade *

Selecionar

**29.** País de residência *

Selecionar

**30.** Quantos anos tem de experiência como tradutor profissional? *

- ◯ Menos de 1 ano
- ◯ 1 a 2 anos
- ◯ 3 a 5 anos
- ◯ 6 a 10 anos
- ◯ Mais de 10 anos

**31.** Quais as suas línguas de trabalho (selecione todas as opções aplicáveis)? *

- [ ] Português
- [ ] Dinamarquês
- [ ] Inglês
- [ ] Francês
- [ ] Alemão
- [ ] Italiano
- [ ] Russo
- [ ] Espanhol
- [ ] Outra: _____

**32.** Com que tipo de clientes trabalha com maior frequência (selecione todas as opções aplicáveis)? *

- [ ] Agências de tradução/Fornecedores de serviços linguísticos
- [ ] Clientes empresariais
- [ ] Clientes individuais
- [ ] Editoras
- [ ] Outra: _____

**33.** Em que mercados trabalha com maior frequência (selecione todas as opções aplicáveis)? *

- [ ] Nacional
- [ ] Europeu
- [ ] Norte-americano
- [ ] Asiático
- [ ] Outra: _____

**34.** Utiliza ferramentas de tradução assistida por computador (*CAT tools*)? *

- ◯ Sim
- ◯ Não

**35.** Se desejar, deixe-nos quaisquer comentários ou informações adicionais que considere relevantes no âmbito do presente estudo.

A sua resposta

**36.** Se pretender saber mais sobre este assunto e receber os resultados deste estudo, por favor, deixe-nos o seu e-mail no campo abaixo.

A sua resposta

## II. Request for the survey approval by the Ethics Committee of the Lisbon University School of Arts and Humanities

U LISBOA | UNIVERSIDADE DE LISBOA  FLUL FACULDADE DE LETRAS  Número CEI FLUL

### PEDIDO DE PARECER À COMISSÃO DE ÉTICA PARA A INVESTIGAÇÃO

#### A – Informação do requerente

| | | |
|---|---|---|
| 1. Nome | Clara Nisa Caetano Pereira de Almeida e Paiva | |
| 2. Função | | **Estudante**<br>(i) Nome do orientador: Helena Gorete Silva Moniz<br>(ii) A investigação tem por objectivo a obtenção de grau académico (Mestrado/Doutoramento)? Sim, Mestrado |
| | | **Docente/Investigador**<br>(i) Se a investigação estiver a decorrer no âmbito de um projecto de investigação financiado, indique o nome do Investigador Responsável: |
| 3. Afiliação (Programa/Centro/Curso) | Mestrado em Tradução | |
| 4. E-mail | clara.niza@gmail.com | |

#### B – Dados do Projecto de Investigação

| |
|---|
| 1. Nome do Projecto |
| Tradução Automática e questões éticas da Inteligência Artificial |
| 2. Duração do projecto |
| Data de início (previsto): Julho de 2023<br>Data de fim (previsto): Setembro de 2023 |
| 3. Resumo do Projecto de Investigação<br>(Deve indicar as etapas de realização do projecto. Anexe, por favor, o protocolo do projecto.) |
| Inquérito integrado na dissertação "Translators and AI: used, abused or praised - Ethical concerns and reflections around MT", realizada para a obtenção do grau de Mestre em Tradução, em cooperação com a Universidade de Tampere, na Finlândia, com co-orientação da Professora Doutora Mary Nurminen.<br><br>Destina-se a todos os tradutores profissionais, tanto com áreas de especialização em tradução automática, como de estudos de tradução, que tenham como línguas de trabalho o português europeu e/ou o finlandês.<br><br>Foi elaborado inicialmente em inglês, tendo posteriormente sido traduzido para português e finlandês, de forma a ser enviado aos inquiridos falantes destas línguas. O questionário já foi testado por 3 "beta testers" com 10-20 anos de experiência que trabalham diariamente no desenvolvimento e treino de sistemas de tradução automática e já inclui os comentários da equipa de orientação e dos "beta testers". |

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Haverá ainda uma fase em que outros três tradutores profissionais em regime de trabalho liberal, com diferentes áreas de especialidade e com mais de 20 anos de experiência testarão o funcionamento do formulário e a facilidade de compreensão das perguntas.

Após estas duas fases de testes, o inquérito será então enviado aos inquiridos que fazem parte do respetivo público-alvo, em colaboração com a APTRAD - Associação Portuguesa de Tradutores e Intérpretes.

Estimamos que esta fase tenha uma duração de cerca de um mês a um mês e meio, após a qual se passará ao tratamento e análise das respostas recebidas.

O inquérito finlandês passará por fases idênticas, no final das quais será realizada uma análise comparativa, com vista à identificação de aspetos transversais e possíveis discrepâncias entre os profissionais que trabalham com estas duas línguas quanto ao seu conhecimento sobre tradução automática, ao impacto que esta tecnologia tem no seu trabalho e à noção que têm sobre as respetivas implicações éticas.

4. Contributo para o avanço do conhecimento
(Tendo em conta o estado da arte na área, mostre que a sua investigação constitui um contributo para a melhor compreensão do tópico.)

A Inteligência Artificial (IA) e a tradução automática estão a transformar a forma como o processo de tradução se desenvolve em todas as áreas de especialização. A capacidade de traduzir em segundos um texto de partida para uma língua de chegada é, hoje em dia, acessível a qualquer indivíduo que disponha de um computador e uma ligação à internet. Nos últimos anos, tem sido realizado um investimento significativo, a que tem correspondido, não só, um enorme avanço tecnológico, mas também uma crescente democratização no acesso a estes sistemas. Embora não sejam perfeitos, os resultados da tradução automática são usados num número crescente de domínios e situações quotidianas, tanto pelo público em geral, como forma de ler rapidamente textos escritos em línguas estrangeiras, como por tradutores profissionais que encontram nesta tecnologia uma forma de acelerar o trabalho e pré-traduzir textos que serão depois pós-editados.

Assim, seja por fazerem uso da tradução automática para fins profissionais ou porque, em algumas situações, são os próprios clientes a usar esta tecnologia, o trabalho dos tradutores profissionais está a mudar a um ritmo acelerado e o processo de mudança não implicou necessariamente uma consciencialização ou mentoria de implicações éticas no uso dos sistemas. A utilização generalizada destes sistemas levanta questões éticas que afetam todos os intervenientes no processo, desde as empresas e engenheiros que constroem os sistemas, até ao público em geral, que consome os resultados da tradução automática, passando pelos tradutores que usam ou vêm o seu trabalho de alguma forma impactado por esses sistemas. É justamente o impacto sentido por este último grupo de profissionais que pretendemos avaliar com este estudo, tendo como objetivo promover o trabalho dos tradutores e lançar algumas pistas que permitam encontrar respostas para os desafios éticos em questão.

Num momento de intensa discussão do uso de sistemas de IA como o ChatGPT como tradutor automático, o questionário é, desta forma, essencial para: i) perceber o grau de conhecimento dos tradutores em relação a questões éticas dos sistemas; ii) analisar de forma comparativa se os profissionais portugueses e finlandeses têm consciência das implicações éticas, daí que a tese esteja a ser espelhada na Universidade de Tampere; iii) contribuir, com base na análise de resultados, com orientações para uma maior consciencialização por parte dos tradutores dos desafios éticos dos sistemas de tradução automática. O projeto mostrou-se de relevo e está mesmo a ser replicado na Finlândia como uma "mirroring thesis".

5. Tipo de projecto

| | |
|---|---|
| x | Estudo descritivo/comparativo |
| | Estudo experimental |
| | Outro. Qual? |

| | |
|---|---|
| 6. O projeto é financiado? | |
| x | Não |
| | Sim. Qual a fonte de financiamento? |
| 7. Tipo de dados: pessoais | |
| | Não (Passe para a pergunta 16.) |
| x | Sim |
| 8. Tipo de dados: de titulares vivos | |
| x | Não. Os dados recolhidos estão relacionados apenas com a experiência profissional e serão devidamente anonimizados |
| | Sim: biométricos |
| | Sim: clínicos |
| 9. Forma de recolha de dados de titulares vivos | |
| | Observação naturalista |
| | Observação estruturada |
| x | Experimentação com base em inquérito sobre aspetos associados a questões éticas no uso de tecnologias de Tradução Automática |
| | Pesquisa documental |
| | Outra. Qual? |
| 10. A recolha de dados pessoais envolve técnicas invasivas? | |
| x | Não |
| | Sim. Quais? |
| 11. Número de sujeitos (previsto) | |
| 30 pessoas. | |
| 12. Sujeitos: Foram definidos critérios de inclusão/exclusão | |
| | Não |
| x | Sim. Quais? Só serão incluídos no estudo os tradutores profissionais cujas línguas de trabalho incluam o português europeu e/ou o finlandês. |
| 13. Sujeitos: A investigação inclui | |
| | Menores (Junte cópia de consentimento para os representantes legais) |
| | Sujeitos com desempenho linguístico comprometido (Junte cópia de consentimento para os representantes legais) |
| | Populações vulneráveis (idosos, doentes psiquiátricos, imigrantes, entre outros) |
| x | Nenhum dos anteriores |

**14. Consentimento informado**

(Deve explicitar todas as cláusulas destinadas a informar os sujeitos do objectivo da investigação e de como serão salvaguardados os seus direitos.)

(Junte cópia. Está disponível um modelo na página web da CEI)

Caso o menor disponha de capacidade de entendimento e manifestação de vontade é necessário também o seu consentimento (recomendável a partir dos 7 anos, obrigatório a partir dos 16 anos).

**15. Existem barreiras linguísticas que possam afectar o consentimento informado?**

| | |
|---|---|
| x | Não |
| | Sim. Quais, e de que maneira serão superadas? |

**16. Como será mantida a confidencialidade dos registos?**

(Faça referência à anonimidade dos dados recolhidos bem como à protecção dos metadados.)

- O inquérito será realizado com recurso a um formulário elaborado com a ferramenta Google Forms;
- Os dados recolhidos serão guardados numa pasta da Google Drive criada especificamente para o efeito, usando a conta Google clarapaiva@edu.ulisboa.pt a que apenas a requerente e as coordenadoras da dissertação terão acesso;
- Os dados serão utilizados exclusivamente no âmbito da investigação;
- Os dados serão anonimizados de forma a não permitir a identificação dos respetivos titulares;
- Não será divulgada qualquer informação que permita a identificação dos titulares dos dados, quer seja no documento da dissertação ou em qualquer outro contexto onde os resultados do estudo possam ser divulgados, incluindo, entre outros, conferências ou publicações da especialidade.

**17. Local onde decorrerá a recolha de informação**

| | |
|---|---|
| x | Portugal. Onde? Não existem limitações geográficas uma vez que os inquiridos serão contactados por email ou através de grupos de profissionais existentes nas redes sociais Linkedin e Facebook |
| x | Estrangeiro. Onde? Não existem limitações geográficas uma vez que os inquiridos serão contactados por email ou através de grupos de profissionais existentes nas redes sociais Linkedin e Facebook |

**18. Existem outros locais, onde a mesma investigação será feita?**

| | |
|---|---|
| | Não |
| x | Sim. Quais? Universidade de Tampere, Finlândia |

**19. Forma de registo de dados**

| | |
|---|---|
| x | Digital |
| | Outra. Qual? |

**20. Como será mantida a segurança dos registos?**

- Os registos serão guardados numa pasta da Google Drive criada especificamente para o efeito, usando a conta Google clarapaiva@edu.ulisboa.pt a que apenas a requerente e as coordenadoras da dissertação terão acesso;
- Os registos não serão tratados por pessoas não autorizadas ou externas à investigação;
- Será garantido o cumprimento do Regulamento (UE) 2016/679 do Parlamento Europeu e do Conselho, de 27 de abril de 2016, relativo à proteção das pessoas singulares no que diz respeito ao tratamento de dados pessoais, e à livre circulação desses dados, nomeadamente o artigo 40º, que se refere ao código de conduta.

| | |
|---|---|
| 21. O projecto tem um perito responsável pela segurança do sistema de informação? | |
| | Não |
| x | Sim. E-mail de contacto: helena.moniz@campus.ul.pt |
| 22. Comentários adicionais (Por favor indicar o ponto a que se referem) | |
| | |

Eu abaixo assinado declaro por minha honra que as informações prestadas neste questionário são verdadeiras. Mais declaro que, durante o estudo, serão respeitadas as recomendações constantes das Declarações de Helsínquia e de Tóquio, da Organização Mundial de Saúde e da Comunidade Europeia, no que se refere à experimentação que envolva seres humanos, bem como o constante na Lei n.º 21/2014, publicada no Diário da República n.º 75, Série I, de 16 de Abril.

Autorizo o tratamento dos meus dados pessoais pela Comissão de Ética para a Investigação da FLUL no âmbito deste pedido.

O/A requerente

Lisboa, 10 de Maio de 2023

## III. Declaration with the survey approval by the Ethics Committee of the Lisbon University School of Arts and Humanities

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Declaração

**A Comissão de Ética para a Investigação** da FLUL emitiu, na sua reunião de 29 de Junho de 2023, parecer **favorável** ao pedido 6_CEI2023, com a designação "Tradução Automática e questões éticas da Inteligência Artificial", submetido por Clara Niza.

29 de Junho de 2023

Inês Duarte
Presidente da Comissão de Ética para a Investigação

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