Technology adoption among Danish translators: Practices, perceptions and prospects

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Abstract

This study examines technology adoption among Danish translators through questionnaire data from 79 professionals. Findings reveal selective integration based on client demands, security concerns and professional identity considerations. Many express concerns about post-editing roles diminishing creative satisfaction and translator agency in increasingly automated translation workflows.

Keywords: translation technology adoption, professional identity, post-editing, translator agency, automated workflows, Danish translators.

Resumen

Este estudio examina el uso de la tecnología entre los traductores daneses a partir de los datos de un cuestionario realizado a 79 profesionales. Los resultados revelan una integración selectiva basada en las demandas de los clientes, las preocupaciones en materia de seguridad y las consideraciones relativas a la identidad profesional. Muchos expresan su preocupación por que los roles de posedición reduzcan la satisfacción creativa y la agencia del traductor en flujos de trabajo de traducción cada vez más automatizados.

Palabras clave: uso de tecnologías de la traducción, identidad profesional, posedición, agencia del traductor, flujos de trabajo automatizados, traductores daneses.

Resum

Aquest estudi examina l'ús de la tecnologia entre els traductors danesos a partir de les dades d'un qüestionari realitzat a 79 professionals. Els resultats revelen una integració selectiva basada en les demandes dels clients, les preocupacions en matèria de seguretat i les consideracions relatives a la identitat professional. Molts expressen la seva preocupació perquè els rols de postedició redueixin la satisfacció creativa i l'agència del traductor en fluxos de treball de traducció cada vegada més automatitzats.

Paraules clau: ús de tecnologies de la traducció, identitat professional, postedició, agència del traductor, fluxos de treball automatitzats, traductors danesos.

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1. Introduction

The translation profession stands at a critical crossroads. While computer-assisted translation (CAT) tools remain widely used, with adoption rates exceeding 80% according to recent surveys (e.g. European Language Industry Survey - ELIS 2025), the landscape is rapidly evolving. The ELIS 2025 report shows that machine translation (MT) usage is increasing significantly, with 69% of independent professionals now using MT on their own initiative, up from 58% in 2024. This suggests that while many translators continue working with established workflows, a growing number are integrating new technologies into their practice. For all practioners, however, these technological shifts raise fundamental questions about the future direction of the profession.

The translation profession has witnessed radical technological shifts over the past three decades, changing and reshaping how translators carry out their work (Cronin, 2013; Karpińska, 2017; Moorkens, 2017). This has evolved from CAT tools in the 1990s through neural machine translation (NMT) around 2016 to generative AI (GenAI) applications in late 2022. These changes occur at different paces across the profession: while some translators continue to maintain more traditional CAT-based approaches (ELIS, 2025), others are already confronting a reality where technology is not merely a tool but an active participant in their professional practice and potentially a threat to their professional livelihood. For these practitioners, this technological progression has fundamentally altered their workflow, client expectations and professional identities (Łukasik, 2024). This suggests that technological adoption is neither uniform nor universal across all translator segments.

For those experiencing this technological change, it extends beyond basic efficiency gains, raising questions about professional autonomy (Hanson et al., 2025; Jiménez-Crespo, 2025) and the future sustainability of translation as a creative profession (Sandrini, 2025). Such questions become particularly pressing given the broader economic pressures shaping working conditions and industry structures (Hanson et al., 2025). Survey evidence suggests that some professionals are already disillusioned by the shift from creative translation to post-editing, with consequences for job satisfaction and professional recognition (Łukasik, 2024; Jiménez-Crespo, 2025).

The current wave of GenAI tools, powered by large language models (LLMs), represents perhaps the most disruptive development yet. Unlike traditional NMT systems that were designed specifically for translation tasks, LLMs offer general-purpose capabilities that can be adapted for translation through techniques like prompt engineering. This creates new possibilities from contextual clarification to interactive editing, but it also creates new uncertainties about quality expectations and skill requirements (Siu, 2023).

These recent developments in translation technology reflect what Tieber and Baumgarten (2024) describe as a broader "sociotechnical (r)evolution", transforming not just translation workflows but also translators' professional identities and their relationship with technology. This aligns with a growing body of literature examining neo-Taylorism within translation studies. Moorkens (2020) introduced the concept of "digital Taylorism"

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to describe how translation companies break down tasks into smaller chunks and rigidly define and monitor translation processes, particularly in platform-mediated work and collaborative workflows. Building on this foundation, Baumgarten and Bourgadel's (2023) concept of "digital neo-Taylorism" examines how AI-powered tools create new forms of work organisation that fundamentally alter the translator's professional practice. Bundgaard and Christensen (2025) further this analysis by applying Baptista et al.'s (2020) framework, which recognises that digital workplace technologies not only bring expected efficiency gains but also changes to the nature of work and to broader organisational structures. Similarly, Cronin (2020) frames these changes within a posthuman context, where the boundaries between human translators and machine systems become increasingly blurred. These perspectives all recognise translation technologies as active participants in translation processes, shaping both practical decisions and theoretical understandings of the profession. This highlights the need for translation studies to adopt a broader sociotechnical perspective that acknowledges technology's active role in reshaping translation practices.

Since the emergence of translation technologies, they have sparked debate among professional translators about industry impact and changing work processes (American Translators Association, 2023; Audiovisual Translators Europe, 2021, 2024; Institute of Translation and Interpreting, n.d.). These debates have also occurred among Danish translators (Lyng, 2023), with professionals expressing varying expectations about how emerging technologies will affect their workflow, productivity and professional standing. Denmark offers a valuable case study for examining technology adoption in translation. As a highly digitalised country (DESI, 2022) with a small language market (European Language Equality, 2022), Danish translators operate at the intersection of technological change and linguistic preservation.

This current research fills two important gaps. First, it provides comprehensive empirical data on how translation technology affects professional practice in Denmark and explores what Danish translators expect of the future. While industry surveys like ELIS 2023, 2024 & 2025 track translation technology adoption across Europe, they include few data points from Denmark specifically. Our study addresses this limitation. Second, the rapid emergence of AI-powered translation tools creates urgent questions about their impact on professional practice and future industry trends. The introduction of NMT and GenAI has sparked intense debate about the future of translation work in Denmark (Arbejderbevægelsens Erhvervsråd, 2024), yet we lack systematic evidence about Danish translators' expectations for future technology integration.

Previous research into translation technologies in Denmark focused primarily on adoption by translation service providers (TSPs) (Christensen and Schjoldager, 2014, 2016). Our study takes a different perspective by focusing on authorised independent translators, who are members of Translatørforeningen (The Danish Certified Translators and Interpreters Association). This provides complementary perspectives into how technology is reshaping the profession. Translatørforeningen includes both translators and interpreters, and membership requires meeting specific criteria: you must have a

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degree in translation or a master's degree — cand.ling.merc. — between Danish and a foreign language (offered at Aarhus University), or a master's degree relevant to the profession and five years' prior experience. Alternatively, you can become a member if you pass the association's entrance exam. For our study, we specifically targeted translator members through the study recruitment email to Translatørforeningen and in the questionnaire instructions.

By examining Danish translators' attitudes, experiences, practices, and expectations for future technological developments, this study aligns with Tieber and Baumgarten's (2024) call to broaden epistemological frameworks within a rapidly evolving sociotechnical ecosystem. Furthermore, this study provides empirical input for translator training by mapping current technology use, challenges and projected trends.

Addressing the call for this issue, our study explores the changing translation technology landscape through four research questions:

RQ1: Which translation technologies are used by Danish translators, and to what extent?

RQ2: What factors influence Danish translators' decisions to adopt or reject specific translation technologies?

RQ3: What are Danish translators' attitudes and expectations regarding future developments in translation technology?

RQ4: How do Danish translators' expectations align with emerging industry trends and predictions?

2. Related research

Christensen and Schjoldager (2014, 2016) conducted a survey on adoption and use of translation technologies by TSPs in Denmark. Of the 25 companies who responded to the survey, 22 (88%) recorded using translation tools. All of them used translation memories, 18 companies (82%) used term bases, and six companies (27.3%) used human MT, or what would be commonly understood today as post-editing. When the survey was conducted in 2013, there was much talk of integrating MT systems into CAT tools, which led to predictions of how MT would play an increasingly important role for both companies and freelance translators. This integration of MT into TM tools was evident by the mid-2010s (Zaretskaya et al., 2015), developed further a few years later (Cadwell et al., 2018), and is now a standard feature of CAT environments, where MT suggestions routinely appear alongside TM matches (do Carmo & Moorkens, 2020). This trend is reinforced by evidence that MT integration and post-editing are now regarded as core competencies for translators (Borgonovi et al., 2023).

Kirov and Malamin (2022) conducted a study to understand the extent to which Bulgarian translators feel threatened by digitalisation and AI, and to gather attitudes on the ways technology will impact their profession. A total of 188 responded to their

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survey, which was sent out in August-October 2019. The findings showed that many of the respondents considered AI and automatisation (including the use of CAT tools) as threats to the profession, specifically to the creative aspects of the job.

Farrell (2023) conducted a survey among 446 professional translators in 2022, to investigate their use of MT and willingness to accept MT post-editing (MTPE) assignments. The study found that while experienced translators were less likely to accept formal MTPE assignments, they were equally likely to use MT in their own workflows. Of the 69.54% who used MT, only 18.57% primarily used it for traditional post-editing. Most preferred alternative approaches, such as using MT as a dictionary, for inspiration, or within CAT tools.

Borucinski, Kegalj and Vukalović (2022) investigated the use of CAT tools by Croatian translators, specifically focusing on the extent these tools are used or not used, whether CAT tools increase efficiency when translating, and which are the most common CAT tools used by Croatian translators. They collected 94 responses, the majority of whom had between 5-15 years' experience as translators, and the most common language pair was English-Croatian. The main reason for using CAT tools was efficiency and clients' requests for the translators to use them. The study did not investigate the use of MT as a possible translation tool.

In a similar vein, Organ (2023) investigated the use of CAT tools by Polish translators through an online questionnaire during the first half of 2023, focusing on establishing a profile of the users who employ CAT in their professional work. The study collected 103 responses and reported that most respondents regularly use CAT tools (81.6%) for all translation projects. In terms of text types, CAT tools are most commonly used for non-literary texts (84.5%) followed by websites (32%). Literary translation (6.8%) and audiovisual translation (4.9%) were the two text types where CAT tools are used least often. Considering the impact of CAT and attitudes towards its use, a high number (92.2%) reported that CAT tools accelerate their work processes, 33% found that CAT facilitated improvements in proofreading, 32% believed that CAT tools allowed them to diversify more in the kinds of projects they undertake, and 96.1% believe that novice translators should invest in upskilling in CAT tools. The main ways the respondents develop CAT skills are talking to other translators (42.7%) and from webinars (41.7%). A small number of translators (3.9%) reported using CAT tools due to explicit client demands.

Cadwell et al. (2018) conducted a study to examine the factors that influence the adoption or non-adoption of MT by professional translators. They compared translators working at an institutional setting (European Commission's Directorate-General for Translation - DGT) and a Language Service provider in the UK (Alpha CRC), using focus groups to collect their data. They found that translators working at the DGT used MT more frequently than those at Alpha CRC and found it more useful. However, both groups agreed that using MT effectively required skill. Reasons from both groups for adopting MT included: increased speed and productivity, suitability for certain text types, high quality output for specific language pairs, inspiration for the translation process,

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assistance with terminology, and help with understanding less familiar source languages. Notably, everyone from the LSP mentioned the inevitability of adopting MT in their work practices and that translators are required to use MT. Some reasons for adopting MT mentioned solely by those from the DGT were fewer keystrokes and clicking, direction from a senior colleague and the translators' genuine interest in improving the MT technology through interacting with it.

Vieira (2020) conducted an analysis of translators' blogs and forum postings, with a focus on general trends in employment, the economy and work automation. Of particular interest in this study is his analysis of translators' attitudes towards MT and what they associate with this topic. While the media often like to sell translators' views of MT being directly linked to pay ("pushing down prices"), Vieira found that their views on MT were based primarily on the business practices that involve MT. Translators do not fear the technology itself, but they are dissatisfied with both its technical limitations and its market effects, particularly how MT is billed, how it might negatively affect pay and how clients use it as a way to reduce costs.

These studies provide valuable international perspectives on translation technology adoption and attitudes, while highlighting the need for our specific investigation into the technology usage, adoption factors, and future expectations of Danish authorised translators, given that new technologies like GenAI have emerged alongside more established CAT tools and MT systems.

3. Methodology

To address our research questions, we conducted a survey study using an electronic questionnaire distributed to members of *Translatørforeningen* in October 2023 (see Christensen et al., 2024). As explained previously in Section 1, the association includes both translators and interpreters, but our recruitment email specifically targeted translators.

3.1 Questionnaire Design

The questionnaire enables collection of both quantitative and qualitative data from the target group, generating comparable data from closed questions with predefined options. This allows for quantitative analyses, and our quantitative results are presented here in graph form as percentages. To address the limitations of closed questions, we also included open questions and comment fields where respondents could elaborate on closed answers or add relevant information in their own words. These open-ended questions produced data for qualitative content analysis (Saldanha and O'Brien, 2013), contributing to a deeper understanding of the topics.

The questionnaire consisted of 32 questions divided into four sections:

1. Translator demographics and professional profile (questions 1-8)
2. Usage of translation technologies (questions 9-21)

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3. Attitudes toward, experiences with, and evaluation of translation technologies (questions 22-31)
4. Open comments (question 32)

To analyse the qualitative data from the open-ended questions and comment fields, the questions were divided between two groups of two researchers each, with one group analysing sections 1-2 and the other sections 3-4. Researchers first independently coded responses, identifying recurring themes before collaboratively discussing their findings to ensure intercoder reliability. We followed Braun and Clarke's (2006) thematic analysis strategy, refining recurring units of meaning into defined core themes. Answers from open-ended fields were coded in relation to the specific technology examined (e.g. CAT, MT). Final themes were reviewed collectively by all four researchers, ensuring consensus and consistency across the dataset.

Prior to sending out the questionnaire, the questions were tested by two translators who are members of *Translatørforeningen*. They were asked to complete the questionnaire and to report any technical problems or comprehension issues. The pre-testing resulted in small edits to improve comprehensibility.

3.2 Demographic profile of participants

Our analysis draws on 79 valid responses from members of *Translatørforeningen*. A total of 82 translators began the questionnaire (38.7% of all members), but three exited before answering the questions central to this article.

The educational background of respondents demonstrates a high level of specialised training, with 89% holding a cand.ling.merc. degree (Master's in International Business Communication), 9% with cand.interpret. qualifications (Master's in Interpretation), and 2% reporting other educational backgrounds. This educational homogeneity reflects the standardised professional pathway typical for certified translators in Denmark. Until 2016, the title of 'translator' was protected, but a change in the law in 2016 has meant that anyone can use this title in Denmark. Nevertheless, to become a member of *Translatørforeningen*, certain standards must be met, as outlined previously in Section 1.

Professional experience among respondents spans from 5 to 45 years, with the majority concentrated in the range 20-35 years, indicating a sample composed primarily of established professionals with strong translation backgrounds (see Figure 1).
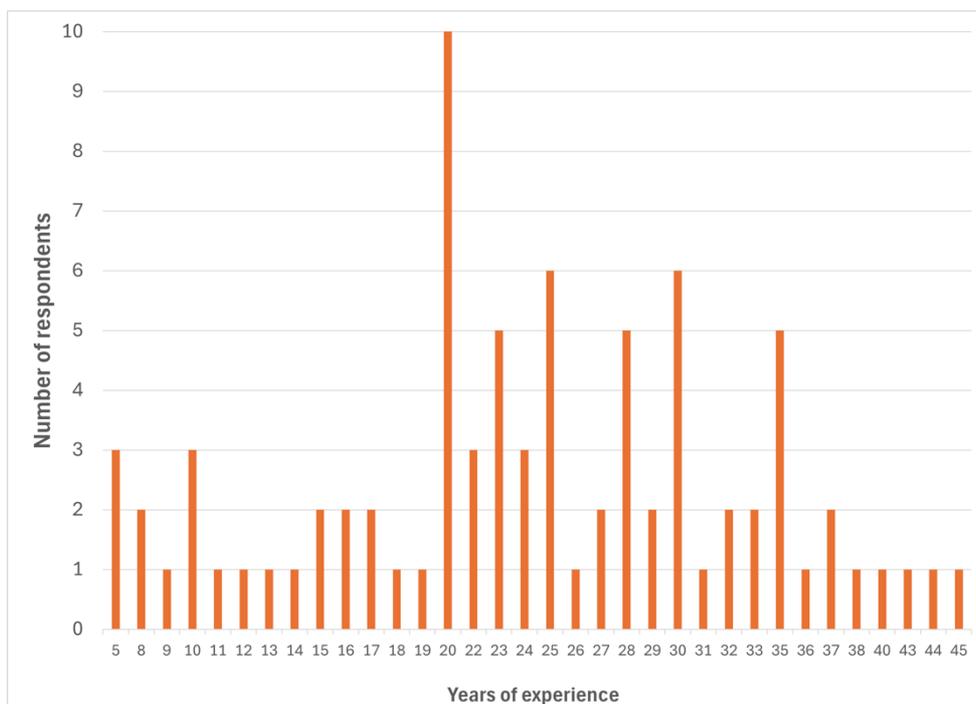
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Figure 1: Professional translation experience in years

Regarding working languages, Danish-English (DA<->EN) emerges as the predominant language pair, reported by 61% of respondents as their primary working combination. This is followed by Danish-German (16%; DA<->TY) and Danish-French (11%; DA<->FR). Other language pairs include Danish with Spanish (ES), Italian (IT), Czech (CZ), Bulgarian (BG) and Dutch (NL). These findings reflect both the global prominence of English and the importance of European languages in the Danish translation market (see Figure 2).
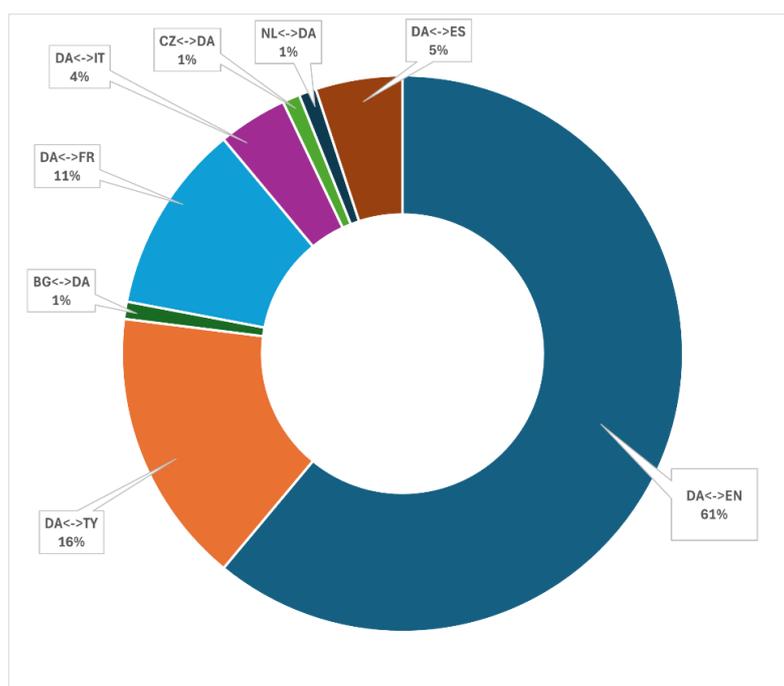

Figure 2: Translators' primary language pairs

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The specialisation areas reported by respondents demonstrate the diverse applications of professional translation, with legal material representing the most common type (76%), followed by financial (50%), technical (46%) and marketing (43%) (see Figure 3).
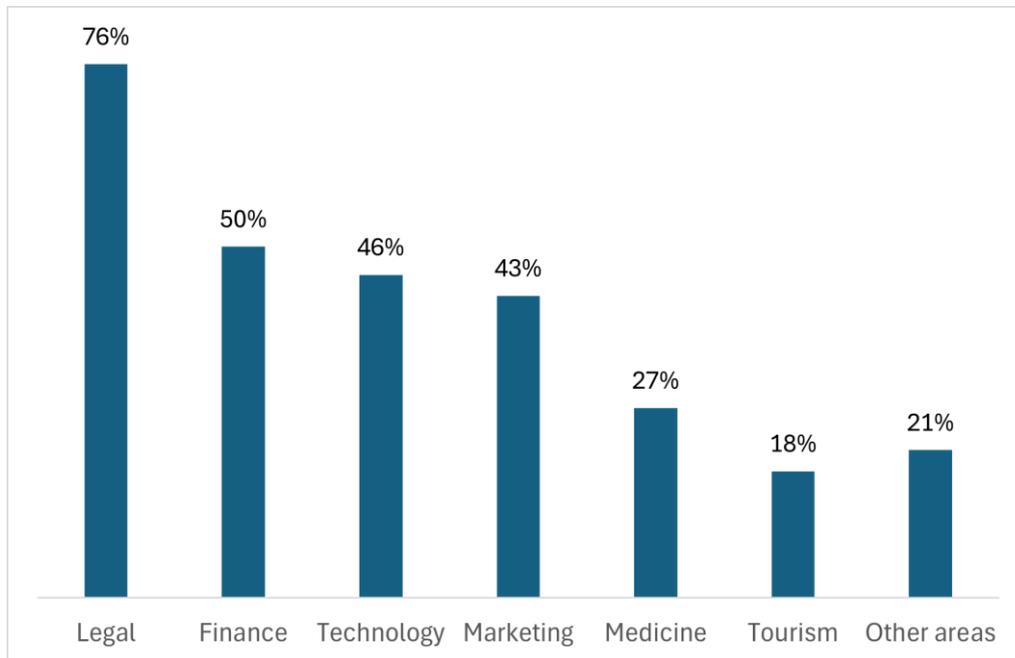

Figure 3: Subject areas of translation

Employment status data indicate that the freelance model dominates the profession, with 95% of respondents identifying as self-employed. Of these self-employed translators, 94% report translation as their main occupation.

The client base of respondents shows diverse business relationships, with 52% working with both direct clients and TSPs. The next group comprising 34% works exclusively with direct clients, while only 14% rely solely on TSPs (see Figure 4).
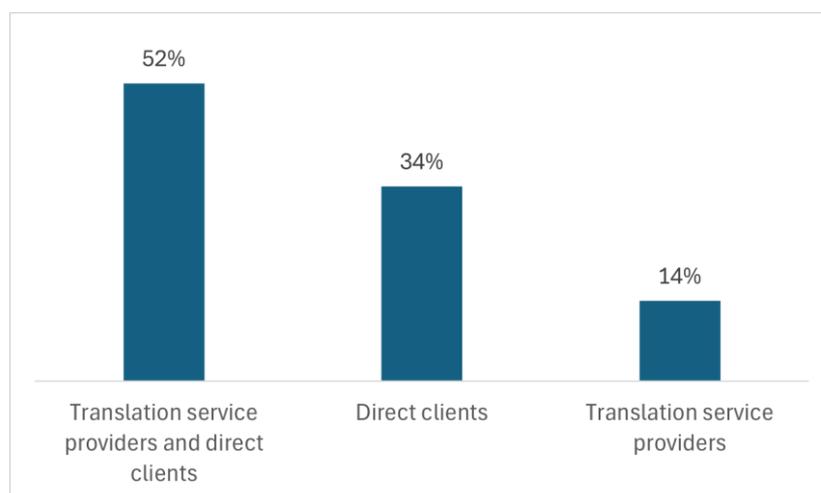

Figure 4: Primary translation clients

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4. Results

We organise our findings around the four research questions that guided this study. For each question, we specify which questionnaire items informed our analysis to establish clear links between our data collection and the findings presented. Throughout our analysis, quotes from respondents are identified with "R" followed by a number (e.g. R58). This structure allows us to systematically examine the technology landscape among Danish translators (RQ1), investigate the range of factors that inform translators' choices around using or rejecting translation tools (RQ2), explore translators' expectations about the future role of technology in their work (RQ3), and finally, situate these expectations within future broader industry developments (RQ4). As the questionnaire was conducted in Danish, all quoted material has been translated into English by the authors for the purposes of this article.

4.1 Which translation technologies are used by Danish translators, and to what extent? (RQ1)

The data from our questionnaire show that Danish translators (n=79) widely use translation technologies, though adoption varies considerably between tool types. We enquired about tool use under the following four categories: 1. CAT tools; 2. CAT tools and their built-in MT function; 3. browser-based MT; 4. GenAI as a translation tool.

4.1.1 Use of CAT tools (category 1)

CAT tools are highly prevalent, with 86% of translators using them regularly in their workflow. Nearly half (48%) rely on CAT tools for every translation task, while others use them less consistently: 17% use them for approximately 90% of their tasks, and smaller groups apply them more selectively (6% for 80% of tasks; 5% for 70% of tasks). Only a small minority (14%) never use CAT tools. This high adoption rate suggests that CAT tools have become a standard part of the professional translation workflow in Denmark. This finding mirrors those from previous studies of translators in Poland, Croatia and Bulgaria described in Section 2, and from the findings by ELIS (2023, 2024, 2025).

Regarding CAT tool preferences, Trados Studio is the most popular (72%), followed by memoQ (40%) and Phrase (formerly Memsource) (36%), matching those reported by ELIS (2024 and 2025). This distribution reflects the strong role Trados Studio has in the market and possibly client requirements, as clients and agencies often specify preferred tools for their contractors. This contrasts with Organ's (2023) finding, where only a small number of respondents (3.9%) cited client requirements as driving their tool selection.

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4.1.2 MT integration in CAT tools (category 2)

Regarding MT integration within CAT tools, more than half of Danish translators (54%) occasionally activate this feature. However, only 9% reported using it consistenly across all translation tasks, while 46% never activate MT in their CAT tools. These results suggest selective use based on factors such as text type, data confidentiality and personal preference.

4.1.3 Standalone MT (category 3)

When looking at standalone browser-based MT tools, we see a similar pattern: 47% report using them, but typically for only a small portion of their work. These standalone MT tools appear to function more as supplementary aids than core components of the translation workflow.

Our findings correspond with broader European trends. ELIS reports (2023–2025) document rising MT use among independent professionals, from 28% in 2023 to an estimated 54% in 2025, with MT becoming an established component of professional translation practice (ELIS, 2024: 31). Similarly, Farrell (2023) found that while 69.54% reported using MT, only 18.57% used it for full post-editing (MTPE). Most preferred hybrid approaches, integrating MT into CAT tools, using it as a dictionary, or drawing on it for inspiration. These findings support our observation that Danish translators, including experienced professionals, increasingly integrate MT into their workflows in flexible and often informal ways.

4.1.4 GenAI as a Translation Tool (category 4)

Most notably in our study, GenAI use is only reported by 6% of respondents, highlighting the newness of the technology and the lack of knowledge of how the tool can be used in translation contexts. This finding is supported by findings of the 2023 ELIS report, where GenAI did not feature in its results for technology use by independent professionals. It did, however, make an entry in the 2024 report at 17%. Moreover, when respondents were asked in the ELIS survey about using technologies for the first time, 28% mentioned they used AI for the first time in 2023 and 21% of independent professionals planned to invest in the technology in 2024. According to the 2025 ELIS report, 43% of independent professionals indicated they now use GenAI in their work, using it primarily as an alternative to NMT systems, for editing and translation quality control, and for creating content.

4.2 What factors influence Danish translators' decisions to adopt or reject specific translation technologies? (RQ2)

From our questionnaire data, we identified six factors that influence adoption or rejection of translation technologies among Danish translators. These factors emerged from both closed-ended responses and thematic analysis of open comments where translators elaborated on their technology choices.

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4.2.1 Efficiency and productivity

Efficiency and productivity are primary motivators for adopting CAT tools and MT. This analysis draws on several questionnaire items: Question 16 (n=35), where translators explained their reasons for using browser-based MT; Question 22 (n=79), where we asked respondents to identify the three most important positive consequences of using translation tools; and Question 24 (n=50), where we asked respondents their opinion on the quality of current MT systems. Respondents highlighted faster workflows, consistency, and reuse of previous translations:

(1) "Saves time." (R28)
(2) "All work can be reused or edited." (R8)
(3) "Consistency in terminology." (R62)

Reasons for using MT included its value as a source of inspiration and a time-saving tool:

(4) "There are many good suggestions, and if you approach it critically and read everything carefully, I think it's a good tool." (R40)
(5) "And it's simply faster than starting from scratch every time with a translation. And time is money." (R58)

Only 6% reported using GenAI tools for translation. Among those, some noted the potential for inspiration, while also stressing the limitations:

(6) "I use it as an additional aid, since it can sometimes suggest useful phrases. Like all other translation aids, it has many limitations, so I use it with some caution." (R69)

4.2.2 Professional identity and control over the process

In Question 12 (n=62), respondents were asked to provide reasons for why they use/do not use the MT function in their CAT tool. Several translators expressed discomfort with the influence of MT on their work, citing concerns about quality and creativity. For some, avoiding MT was a way to retain control over the translation process:

(7) "I use memoQ without machine translation because I'm afraid I'll be influenced by the suggestions it offers... I also think I might end up deleting too much anyway, which means I wouldn't actually save time by looking at the MT output." (R5)

Another respondent to this question rarely uses the MT function in the CAT tool because they see translation as a creative task. They also believe that MT can negatively affect the quality of their work and their professional integrity, and expressed discomfort about being influenced or "trapped" by machine-generated suggestions, viewing translation fundamentally as a human-centered and intellectual activity:

(8) "I don't like machine translation, as I feel it makes my translations worse – and at the same time I lose some of my motivation, because my motivation lies in the creative part of the translation process." (R25)

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4.2.3 Text and genre specificity

In Question 24 (n=50), respondents who use MT were asked to rate its raw output quality. Nearly half gave a neutral rating, while 40% rated it as high or very high quality. Comments revealed that perceived quality varied significantly by genre, with several noting that tools like Google Translate perform well on standardised, repetitive texts due to extensive prior training, as reflected in the following comment:

> (9) "The quality varies greatly and depends heavily on the text I'm working with. If I'm translating GDPR or standard phrases from websites or apps, I can almost use the sentences as-is." (R53)

Yet, respondents noted that MT often struggles with creative or complex language, producing inconsistent output. Others emphasised that MT quality depends heavily on training data, reflecting the "garbage in, garbage out" principle:

> (10) "The quality largely depends on the texts MT has been trained on… In general, MT is heavily influenced by the syntax of the source language, which can make the translation worse." (R55)

4.2.4 Tool suitability and technical knowledge

Based on responses to seven survey questions on tool adoption (n ranging from 5 to 71), the three most common reasons given were related to the unsuitability of the tool (often linked to specific text genres), lack of technical knowledge (what the tool can do), and lack of operational knowledge (how to implement it). Across the four tool categories (CAT, CAT with MT, browser-based MT, and GenAI), an average of 47.5% cited text unsuitability, suggesting that translators make practical, genre-specific decisions rather than applying tools universally.

Similarly, 41.75% mentioned insufficient technical knowledge, and 32.25% cited lack of operational skills as barriers to adoption. These figures highlight a need for professional development that focuses not just on awareness but on hands-on implementation. The distinction is critical: many translators know about these tools but lack the skills to integrate them meaningfully into their workflows.

4.2.5 Client demands

External pressure from clients and agencies was a significant factor shaping translators' use of specific technologies (n=48–71 across Questions 12, 16, 20, 26). Many respondents indicated that tool use was not a matter of personal preference but of compliance with client requirements. Translators reported little control over workflows, especially when agencies mandated CAT tools or provided pre-translated MT output for post-editing:

> (11) "Because I'm forced to." (R47)
> (12) "The EU Court prohibits the use of tools other than those they provide." (R42)
> (13) "Agencies require CAT tools – and often machine translation, which I have to correct." (R62)

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Conversely, some translators avoid browser-based MT because clients explicitly prohibit it:

(14) "Agencies often require that I do NOT use it. Many even have it as an explicit requirement." (R13)

(15) "My direct clients expect a professional translator who does not use machine translation." (R62)

4.2.6 Data security and confidentiality

Concerns about data protection and confidentiality were frequently cited as reasons for not using certain translation tools (n=29–71 across Questions 12, 13, 14, 17, 20). Respondents expressed unease about exposing sensitive client information via online platforms, particularly considering GDPR. Specifically, 33% cited data concerns for avoiding MT in CAT tools, 40% for browser-based MT, and 42% for GenAI. Respondents specifically worried about exposing confidential information:

(16) "My translation assignments are often highly confidential and contain sensitive personal data." (R45)

(17) "I use CAT without MT because I'm unsure about the level of confidentiality when activating MT." (R80)

These data concerns extend beyond translators to client-imposed requirements. One respondent explained:

(18) "For one major client, we were explicitly told not to use tools like Google Translate – they don't want their texts out in 'cyberspace.'" (R40)

Our findings for RQ2 align with and extend several points highlighted in previous studies. Cadwell et al. (2018) identified that translators' decisions to adopt or resist MT technologies are strongly influenced by text type, language pair, perceived quality and trust. Their study of professional translators in institutional and commercial settings showed that most make pragmatic, context-sensitive decisions about MT integration, rather than accepting or rejecting it outright. This pattern is reflected in our data: Danish translators described making task-specific decisions about tool use, shaped by genre, perceived output quality and client requirements.

As Vieira (2020: 15) argues, "most criticism of MT concerned primarily not a fear of being outperformed by MT systems or an intrinsic aversion to the technology, but rather MT's current limitations and some of the business practices that surround its use." This is echoed in our findings: in response to Questions 17 & 20 regarding technology avoidance, relatively few respondents expressed concern about technological displacement (19% for MT; 18% for GenAI), while most critiques focused on quality, ethics, or pressure from clients or agencies to adopt specific tools. Similar patterns emerged in Jiménez-Crespo's (2025) US study of professional translators, where participants' concerns centered less on AI technology and more on autonomy loss when tool use was externally dictated. This parallels our Danish respondents, who similarly prioritise control over their tool choices. This cross-Atlantic pattern reinforces Vieira's

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observation that professional resistance stems from implementation conditions rather than technological opposition.

Sakamoto (2019) offers a sociological perspective on translators' resistance to post-editing, applying Bourdieu's concepts of capital, field and habitus. She suggests resistance stems from translators pivoting from cultural capital (linguistic expertise) to economic capital (efficiency), creating what Bourdieu calls a "hysteresis effect". This theoretical lens helps explain our respondents' concerns about professional identity when using MT, particularly when they express that MT diminishes their creative satisfaction and quality of work. These concerns align with Moorkens' (2020) analysis of how fragmented translation workflows reduce job satisfaction and professional recognition, and do Carmo's (2020) analysis of how economic pressures and time contraints in post-editing contribute to the professional devaluation of translation work.

4.3 What are Danish translators' attitudes and expectations regarding future developments in translation technology? (RQ3)

To address RQ3, we analysed responses to Question 30 (n=70) on anticipated impacts of translation tools over the next five years, open comments to Question 31 regarding technostress—the stress experienced by end users of technologies (Ragu-Nathan et al., 2008), additional reflections provided in Question 32, and Question 21 (n=76) on plans to implement new tools during the coming year.

Four main themes emerge from the responses to Question 30: (1) changes in the translator's workflow, (2) developments in the industry, (3) perceived impacts on language and translation quality, and (4) the prioritisation of speed over quality. A fifth cross-cutting theme emerged across the four questions: (5) emotional and professional responses to technological change, including technostress, skills adaptation and lack of job security. Additionally, responses to Question 21 revealed whether translators plan to adopt new tools and what influences these decisions.

4.3.1 Changes in the translator's workflow

A recurring theme is the transformation of the translator's role from content creator to language reviser. Many respondents anticipate that post-editing of machine-generated text will become the norm, replacing traditional translation "from scratch". This post-editing is referred to as revision, proofreading, or linguistic reviewing. One respondent noted:

(19) "I believe even more translators will be working with editing machine-translated and AI-generated texts in the coming five years rather than translating from scratch." (R42)

Others voiced concern that this shift not only diminishes creative engagement but also negatively affects pricing and job satisfaction. Ultimately, these changes are undesirable:

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(20) "If this trend continues, being a translator will become much duller. Many jobs are heading toward revision of (machine) translated texts – it's really boring." (R9)

4.3.2 Developments in the industry

Some respondents anticipate that as MT and GenAI become more accessible to end users, clients will increasingly bypass professional translators altogether. Several foresee a future where human translation becomes a niche or premium service, while mainstream demands are met by technology:

(21) "Some tasks will be handled by clients themselves using AI. The client will probably produce a machine translation and adapt it themselves (which they are quite capable of doing if it's within their own field)." (R2)

(22) "The translation industry will disappear with AI. The only question is when." (R49)

(23) "It may become more difficult to convince people that it takes a professional to produce a professional translation." (R39)

Yet, not all perspectives are dystopian. A few respondents expect limited change over the next five years, arguing that certain text types, most likely those requiring cultural fluency, irony, or rhetorical sensitivity, will remain out of reach for machines. The following respondent sees AI as a limited tool, and not as a replacement:

(24) "Some clients will definitely try using ChatGPT and similar tools themselves, but there are still many areas where the machines fall short." (R16)

Another respondent distinguished between broad industry trends and their personal practice:

(25) "In the industry in general, tools such as machine translation, post-editing and AI will definitely come to play a larger role [...] but I don't expect my own work situation to change much. I will possibly come to use more tools than today, but that probably won't happen within the next 5 years, and if it does, it will only be to a limited and cautious extent." (R52)

4.3.3 Perceived impacts on language and translation quality

A subset of respondents expressed concern that as machine translation quality improves, the acceptance of substandard output will increase. Some worry this trend may erode linguistic richness and even influence language norms more broadly:

(26) "If MT becomes too dominant, it may start to affect the language, similar to how English has influenced Danish." (R65)

4.3.4 Efficiency over quality

The final theme identified is the perception that market forces, particularly among large agencies, are shifting toward speed and cost-efficiency at the expense of linguistic quality. Respondents expressed dismay that language expertise and specialised knowledge are increasingly sidelined:

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(27) "More agencies are entering the market without any linguistic background. It's all about profit and quick turnarounds, and quality is being forgotten." (R62)

4.3.5 Technostress, market consolidation and strategic adaptation

Responses to Questions 31 and 32 revealed additional perspectives on technostress and adaptation strategies. While many respondents view technological tools as practical necessities, they also report pressure to constantly upskill, work faster and remain connected for longer. Some accept this as inevitable:

(28) "It's important to keep up with technological development… the tasks will change." (R16)

Others describe cognitive overload, with one respondent self-identifying as "tech-averse" (R23). Concerns about market consolidation emerged, with respondents noting that large agencies with in-house IT teams gain competitive advantages:

(29) "Big agencies with their own IT staff are at a massive advantage. It's costing small agencies and freelancers clients" (R80).

Nevertheless, many advocated a balanced perspective, viewing technology as a complement to human expertise rather than a replacement:

(30) "Technology isn't a threat. It gives me new tools that make my day easier. But it also pushes down prices. It's only sustainable if the tech actually saves us time." (R46)

Regarding future technology adoption (Question 21, n=76), 26% planned to implement new tools within a year, with nearly half specifically mentioning GenAI applications. The primary hesitation regarding tool adoption was not resistance to technology itself, but insufficient knowledge of how to implement the tools effectively:

(31) "I answered no, but only because I don't have any knowledge about what it should be. However, I have started that process." (R7)

These varied perspectives on the impact of technology raise important questions about how Danish translators' expectations align with broader industry trends, which we explore in RQ4.

4.4 How do Danish translators' expectations align with emerging industry trends and predictions? (RQ4)

When situating our findings within the broader European context (ELIS 2023-2025), we observe notable similarities and differences.

First, the low GenAI adoption rate among Danish translators (6%) appears to follow a broader pattern of cautious adoption visible across Europe. The ELIS 2024 report showed 17% implementation and 8% actual use among independent professionals, rising to 43% in the 2025 report. A follow-up meeting with our questionnaire participants in June 2024 to discuss our report confirmed this trajectory, with several Danish translators

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who initially reported non-use of AI having since begun experimenting with these tools (personal communication, Translatørforeningen, 19 June 2024).

This gradual adoption aligns with what the ELIS reports from 2024 and 2025 identify as familiarisation with AI technologies. The 2025 report notes that AI and language technology "dominated and polarised the industry even more than before" (ELIS, 2025: 20), suggesting increased engagement but continued mixed reactions. The 2024 ELIS report highlighted independent professionals' concerns that widespread public acceptance of AI would increase acceptance of MT as a valid replacement for human translation, ultimately "reducing the appreciation, and therefore also the financial compensation, for human language work" (ELIS, 2024: 40).

Second, Danish translators' expectations of a future where technology-based translation services coexist with premium human translation align closely with the broader trends identified in the ELIS reports. One respondent noted:

 (32) "I'm already seeing a two-tier market forming. Some clients want the fastest, cheapest option and are happy with MT plus light post-editing. Others understand the value of human expertise and are willing to pay for it." (R63)

This observation mirrors a trend first noted in the 2024 ELIS report and reinforced in the 2025 findings, which explicitly mentions two market segments: "standard industrial post-editing vs high quality human translation" (ELIS, 2025: 21). The persistence of this trend across consecutive reports suggests Danish translators accurately anticipate a sustained structural change in the market.

Third, concerns about confidentiality and data security among Danish translators appear more pronounced than in the broader European market across the reports. While 42% of our respondents cited data security as a reason for not adopting GenAI, this issue receives comparatively less attention in the ELIS reports.

Fourth, CAT tool use among Danish translators (86%) remains consistent with the European average reported in all ELIS reports since 2023. However, adoption of MT appears more measured. In Denmark, 54% activate MT within CAT tools, and 47% use browser-based MT. These figures fall slightly below the European trend of growing voluntary MT use. The ELIS 2025 report documents a significant rise: 69% of freelancers chose to use MT in 2025 (up from 58% in 2024), and 29% reported using it in over half their projects (up from 16% in 2024). Among Danish translators, MT is often framed as a "source of inspiration and a time-saving tool" (R40, R11, R58). This motivation aligns with the broader trend across Europe, though Danish adoption remains more cautious and selective.

Finally, and perhaps most strikingly, Danish translators express a more optimistic outlook on their professional future than the broader European sample. The ELIS 2025 report notes that only 47% of European freelancers consider their career sustainable (down from 64% in 2023) with 23% considering leaving the profession. In contrast, many Danish respondents conveyed confidence in their adaptability, particularly those with

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direct client relationships. However, this optimism was not universal, with some respondents considering early retirement due to technological disruption:

(33) "I expect machine translation post editing to become more prevalent, so we'll see more and more advanced proofreading rather than actual translation. Unfortunately, translation is what I'm passionate about - so I don't expect to be a translator until I retire." (R25)

(34) "Personally, I am seriously considering early retirement. I feel redundant, taken over by machines… Payment is constantly decreasing." (R63)

These more ambivalent perspectives are echoed in responses to Questions 23 (n=58) and 28 (n=76) of our survey. The ELIS 2024 and 2025 reports highlight mounting concerns about "stronger price pressure" and "the generalised move from human translation to discounted and less-valued post-editing" (ELIS, 2025: 19). Danish translators shared these concerns, particularly regarding downward pressure on prices and the undervaluing of human expertise:

(35) "[Technology is] used to push prices down, even more than the increased productivity justifies." (R39)

(36) "Clients don't understand that sentences with an 85% match still take time to translate, and that you don't actually achieve an 85% saving." (R36)

(37) "I politely say no thank you to PE (post-editing) at a very low rate for machine-translated texts, which most often require extensive revision/proofreading." (R62)

While the data from ELIS 2024 note a shift toward "value-added services" and the ELIS 2025 report highlights a growing emphasis on diversification and upskilling, Danish responses reflect a more cautious, and at times reluctant, stance toward this transformation. For many, post-editing is seen not as a strategic opportunity, but as a compromise:

(38) "There are more and more MTPE assignments. As a translator, I can accept that, but my income is falling. That is why I have considered becoming a translator as a side job." (R22)

(39) "I expect that we translators will increasingly be proofreading rather than translating." (R70)

The following discussion considers how our findings reflect broader shifts in translation practice and what they suggest for translator education and professional development.

5. Discussion

Our findings from Danish translators reveal specific patterns of technology adoption and resistance that resonate with broader trends across the translation industry, illustrating how professionals navigate technological change in practice. Together with industry reports such as ELIS 2023-2025, our findings highlight the contined importance of CAT-based workflows alongside rising MT and GenAI adoption. Drawing on our data and situating it within wider trends, we consider implications for the future of translation and the evolving role of the translator.

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The future of translation appears increasingly oriented towards automation-supported workflows, particularly post-editing and revision. While some professionals embrace this shift as a path to strategic adaptation, others—including many Danish translators—frame it as a loss of agency, motivation and creative fulfilment. Our data show Danish translators' responses to GenAI reflect a familiar trajectory, mirroring earlier MT reactions. This suggests a repeating cycle of initial caution followed by selective integration based on professional considerations rather than technological aversion. The historical shift of MT from a perceived threat to a standard tool suggests that GenAI may follow a comparable path, although potentially with deeper implications for labour conditions and translator autonomy (Herbert et al., 2023). Herbert et al.'s survey study showed that unlike MT, which primarily affected the translation process itself, GenAI and broader workflow automation threaten to reshape translator decision-making in multiple ways: shifting control from humans to algorithms, limiting professional growth by confining translators to specialised areas despite their desire for variety, diminishing translators' sense of ownership over their work, and blurring accountability when problems arise. These implications represent a challenge to translator agency and professional development that requires proactive engagement from both educational institutions and industry.

As outlined in RQ4, the convergence of pricing pressure, automation and reduced appreciation of human expertise raises concerns about the sustainability of professional freelance translation work. Such challenges highlight the urgency of redefining professional value. This reflects do Carmo's (2020) finding that post-editing requires working with three documents simultaneously under time pressure, despite being promoted as a time-saving, simple revision activity, and Moorkens' (2020) analysis showing how digital Taylorism reduces translation work into monitored micro-tasks, with one translator describing themselves as 'just a tiny cog in a large machine' (2020: 20). Translators' contributions cannot be measured purely in terms of speed or match percentages; their roles as cultural mediators and domain specialists must be foregrounded in future industry narratives.

Rather than positioning translators as passive victims of technological change, we propose that the path forward lies in strategic, critical adaptation that recognises machines as co-agents while still prioritising human needs and control. This balanced approach builds on Tieber and Baumgarten's (2024) recognition of technology as an active participant while incorporating O'Brien's (2023) emphasis on human oversight. Drawing on Shneiderman's (2020) notion of human-centered artificial intelligence (HCAI), O'Brien argues against an "antagonistic dualism" between humans (us) and machines (them), instead framing technology as an extension of human capacity that enhances rather than diminishes the work of the translator.

While the concept of "augmented translation" has emerged in industry discourse primarily focused on efficiency (Lommel & DePalma, 2021), O'Brien (2023) advocates for a more thorough understanding that shifts from emulation to empowerment. She emphasises the need for technology that amplifies the translators' abilities rather than

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just replacing their functions. Furthermore, she highlights the importance of personalisation to accommodate individual translator needs and preferences. This perspective aligns with emerging discussions around human-centered augmented machine translation (HCAMT), which builds upon Shneiderman's HCAI framework (2022) in translation contexts. Unlike systems that aim to replace human judgment, HCAMT approches are designed to reduce cognitive load and empower translators through augmentation, with early studies indicating enhanced performance and increased comfort (Briva-Iglesias et al., 2023).

This has direct implications for translator education and professional development. Technical proficiency is necessary but insufficient for future-ready translators. Krüger (2024) outlines an artificial intelligence literacy framework for translation, interpreting and specialised communication that extends beyond technical skills to include critical engagement with tools and workflows, as well as knowing the ethical implications of technology. Our findings reveal varying levels of these competencies among Danish translators, underscoring the importance of integrating such a framework into translator education. As Moorkens (2017: 473) notes, translators must "continually add new competences to maximise their agency and relevance within the rigid confines of a technologised industry."

For HCAMT to realise its full potential, translators must be positioned not just as tool users but as active co-designers of the technologies they work with. However, individual skill development alone cannot address the systemic challenges in the field. As Sakamoto and Bawa Mason (2024) observe, many small and mid-sized language service providers remain excluded from conversations that shape industry standards, while Moorkens (2023) warns that algorithmic workflows risk reducing translator value to quantifiable metrics. A sustainable future depends on this shift from automation imposed from above to collaborative systems shaped from within, where translator expertise directly informs technological development and contributions from both humans and machines are recognised.

6. Conclusion

This study has shown that Danish translators are navigating technological change with careful pragmatism, neither rejecting new tools outright nor embracing them uncritically. As translation work becomes increasingly shaped by sociotechnical forces, the profession faces a crucial inflection point. Looking ahead, translators will need to develop competencies by blending linguistic expertise with technological literacy and consultive skills. If translators are to remain central to high-quality text production, they must be supported through better tools, sustainable working conditions and inclusive policy decisions. Future research should explore how translators maintain agency within shifting technological landscapes, including human-centered augmented approaches, sustainable pricing models that value translator expertise and educational frameworks that prepare professionals for emerging market demands. The question is no longer whether the

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profession will change but whether it can evolve in a way that allows translators to thrive while maintaining control and agency in increasingly automated workflows.

7. Author Contributions

Conceptualization: MF, HDJ, KB, TPC; Data curation: MF, HDJ, KB, TPC; Formal analysis: MF, HDJ, KB, TPC; Investigation: MF, HDJ, KB, TPC; Methodology: MF, HDJ, KB, TPC; Project administration: TPC; Resources: MF; Validation: MF, HDJ, KB, TPC; Visualization: MF, HDJ, KB, TPC; Writing – original draft: MF, HDJ; Writing – review & editing: KB, TPC, HDJ, MF

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