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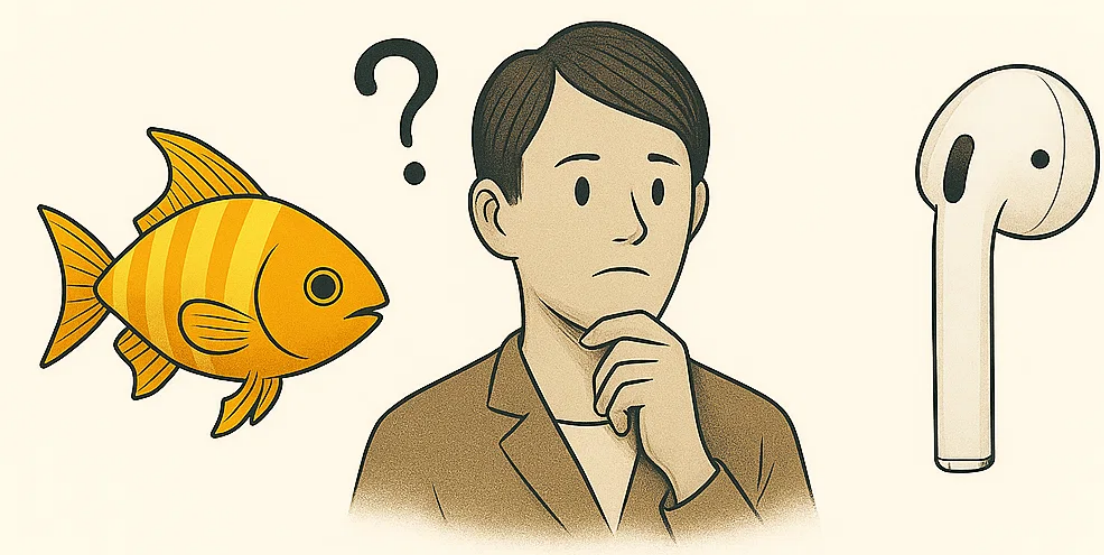

Report

Between Humans and Machines:
Emerging technologies, possibilities and challenges in the field of public sector interpreting in Norway

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SUMMARY
This report examines how emerging technologies, especially AI and automation, are reshaping public service interpreting and how these developments interact with the Norwegian Interpreting Act. While tools such as speech-to-text, machine translation and remote solutions can assist interpreters and improve workflow, interpreting remains a complex, context-dependent task that requires human judgement. Fully automated interpreting in the public sector still carries significant risks. The report reviews technological trends, market developments, and interpreter attitudes, and outlines how new tools can be responsibly integrated. The report concludes with a set of recommendations: making evidence-based decisions based on multiple sources; developing a common policy regarding machine translation and interpreting, in dialogue with relevant public bodies and stakeholders; monitoring grey zones, such as settings in which interpreters are not normally used despite language barriers; improving assignment workflow processes; developing quality standards for interpreting tools; fostering research on new technology and strengthening curricula in interpreter education; and enhancing practising interpreters' technological competence.

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Executive summary

This report examines the interaction between emerging technologies, established interpreting practices and the legal framework for public sector interpreting in Norway, as set out in the Norwegian Interpreting Act. The aim is to support public bodies and other stakeholders in making qualified, proportionate, and responsible decisions about the role of technology in the field of interpreting.

The report explores how emerging technologies, particularly artificial intelligence (AI), automation, natural language processing (NLP), and remote communication tools, are impacting the field of interpreting. The report examines the rapid developments in speech-to-text, machine translation, and machine-based interpreting systems, and how such technologies can support, augment, and in some cases replace human interpreters. In addition, it outlines how market participants are trying to take advantage of technological developments, either in the form of entirely new tools or by integrating new technology into existing interpreting tools. The report also examines interpreters' use of technology and their attitudes towards technological developments.

A key finding is that interpreting remains a skill-based, context-dependent activity where human judgement, situational awareness and ethical responsibility are crucial. While technology can improve workflow, preparation, availability, and access to resources, especially through machine-assisted translation and interpreting tools and remote interpreting solutions, full automation of interpreting in the public sector still poses significant risks.

Having mapped technological trends, market developments, and interpreters' attitudes in general, the report then focuses on the Norwegian context. In Norway, public sector interpreting is regulated by the Interpreting Act, which establishes criteria for when an interpreter should be used and who is qualified to interpret. The Act also requires public bodies to establish guidelines for interpreting.

The report then analyses how new tools can be used responsibly, outlines future scenarios ranging from gentle technological augmentation of human interpreting to disruptive automation, and provides recommendations on governance, quality standards, professional training, and evidence-based decision-making. Overall, it emphasises that while technology will inevitably shape the interpreting ecosystem, its introduction must be cautious and deliberate to ensure quality, legal safeguards, and the long-term sustainability of the interpreting profession.

The report concludes with a set of recommendations for the future development of the interpreting ecosystem. The recommendations revolve around three main pillars: increasing governance and decision capacity in the public sector when it comes to interpreting and technology (1), strengthening quality and controlling risk associated with interpreting technology (2), and supporting competence and professional sustainability among interpreters, in view of the changing technological landscape (3). More specifically, seven recommendations are made:

- Making evidence-based decisions based on multiple sources
- Developing a common policy regarding machine translation and interpreting, in dialogue with relevant public bodies and stakeholders
- Monitoring grey zones, such as settings in which interpreters are not normally used despite language barriers
- Improving assignment workflow processes
- Developing quality standards for interpreting tools
- Fostering research on new technology and strengthening curricula in interpreter education
- Enhancing practising interpreters' technological competence

Norsk sammendrag

Denne rapporten undersøker samspillet mellom nye teknologier, etablert tolkepraksis og det juridiske rammeverket i Norge som er fastsatt i tolkeloven. Målet er å legge til rette for at offentlige organer og andre interessenter kan ta kvalifiserte, forholdsmessige og ansvarlige beslutninger om teknologiens fremtidige rolle på tolkefeltet.

Rapporten utforsker hvordan nye teknologier, spesielt KI, automatisering, naturlig språkbehandling (NLP) og verktøy for fjernkommunikasjon påvirker tolkefeltet. Rapporten undersøker den raske utviklingen innen tale-til-tekst, maskinoversettelse og maskinbaserte tolkesystemer, og hvordan slike teknologier kan støtte, styrke eller i noen tilfeller erstatte menneskelige tolker. I tillegg skisserer rapporten hvordan markedsaktørene forsøker å dra nytte av den teknologiske utviklingen, enten i form av helt nye verktøy eller ved å innlemme teknologien i eksisterende verktøy. Rapporten undersøker også tolkenes bruk av ulike former for teknologi og deres holdning til den teknologiske utviklingen.

Et sentralt funn er at tolking fortsatt er en særs ferdighetsbasert, kontekstavhengig aktivitet, der menneskelig skjønn, situasjonsforståelse og etisk ansvar er avgjørende. Selv om teknologi kan forbedre arbeidsflyt, tilgjengelighet, forberedelse til oppdrag og tilgang til ressurser, spesielt gjennom maskinassisterte tolke- og oversettelsesverktøy og løsninger for fjerntolking, medfører full automatisering av tolking fortsatt en betydelig risiko i offentlig sektor.

Etter å ha kartlagt teknologiske trender, markedsutviklinger og tolkenes holdninger generelt, fokuserer rapporten på den norske konteksten. I Norge reguleres tolking i offentlig sektor av tolkeloven, som fastsetter kriterier for når det skal brukes tolk og hvem som er kvalifisert til å tolke. Loven krever også at offentlige organer etablerer retningslinjer for tolking.

Rapporten analyserer deretter hvordan nye verktøy kan tas i bruk på en ansvarlig måte. Rapporten presenterer fremtidige scenarier som spenner fra forsiktig styrking av menneskelig tolking ved hjelp av teknologi, til nedbrytende automatisering, og gir anbefalinger om styring, kvalitetsstandarder, opplæring av profesjonsutøvere og evidensbasert beslutningstaking.

Samlet sett understreker rapporten at teknologi vil påvirke tolkefeltet, men bør innføres med omhu for å sikre kvalitet, rettssikkerhet og bærekraft på tolkefeltet og i tolkeyrket. Rapporten avslutter med et sett anbefalinger om utvikling av tolkefeltet. Anbefalingene er delt i tre hovedgrupper: øke styrings- og beslutningsevnen i offentlig sektor når det gjelder tolking og teknologi (1), styrke tolketeknologiens kvalitet og kontrollere risiko (2) og bygge et kompetent og profesjonelt tolkekorps med tanke på et teknologisk landskap i endring (3). De syv konkrete anbefalingene er:

- Ta evidensbaserte beslutninger basert på flere kilder
- Utarbeide felles retningslinjer for maskinoversettelse og -tolking på tvers av offentlig sektor
- Overvåke gråsoner, for eksempel settinger der det normalt ikke brukes tolk på tross av språkbarrierer
- Forbedre arbeidsflyt for tolkeoppdrag
- Utvikle kvalitetsstandarder for tolkeverktøy
- Styrke læreplaner og forskning på ny teknologi innen tolkeutdanningene
- Heve teknologisk kompetanse blant praktiserende tolker

Foreword

Technological developments are reshaping public services and playing an increasingly significant role in organising communication between governments and citizens. In multilingual societies, interpreting is a key mechanism for ensuring democratic participation, legal safeguards, and equal access to public services for individuals who cannot communicate adequately in the majority language. As digitalisation advances, it becomes essential to understand how emerging technologies may support, alter, or challenge established interpreting practices, and what this implies for quality, accountability, and inclusion in communication across language barriers.

In April 2024, the Directorate of Integration and Diversity (IMDi) issued a tender on *Emerging technologies, possibilities, and challenges in the field of interpreting*. The tender called for a broad-based study to examine how digitalisation, including but not limited to the use of artificial intelligence, could influence the field of interpreting and to provide an overview of the opportunities and challenges this development presents.

This work was carried out in close collaboration between research partners with complementary areas of expertise. OsloMet contributed analytical perspectives from interpreter education and interpreting studies, grounding the analysis in professional practice, training requirements, and quality considerations. Claudio Fantinuoli at the University of Mainz, a recognised international researcher in the field of computer-assisted and automated interpreting, provided expert insight into interpreting-specific technologies and their technical affordances and limitations. SINTEF contributed at the intersection of technology, work, and organisational processes, enabling analysis of how emerging technologies interact with work practices, risk, and institutional responsibility.

The work was conducted as a collaborative effort involving all partners. Throughout the project, we held regular Teams meetings, as well as in-person meetings and workshops. The report is a genuinely joint product, reflected in the shared authorship. The research team has maintained a close and constructive dialogue with IMDi, and we have benefited from input from a wide range of actors, all of whom have shown consistent engagement and interest. While the content and conclusions of the report remain the responsibility of the authors, we are grateful for the valuable contributions and support received.

The work reflects a shared ambition to support informed and responsible decisions about the role of technology in interpreting, grounded in the Norwegian public sector interpreting tradition, with knowledge and respect for the perspective of the actors and in line with SINTEF's vision: *Technology for a better society*.

On behalf of the authors,
Hans Torvatn

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1 Introduction

Interpreting is a highly skilled, time-critical activity performed under conditions with limited opportunity for revision or correction. Unlike written translation, interpreting is usually carried out on site and involves the immediate rendering of meaning from one language into another, typically in spoken or signed form and based on a single presentation of an utterance. The output is instantaneous and short-lived. Translation, by contrast, transfers meaning across languages or modalities and is usually associated with written texts that can be reviewed and revised.

Interpreting is performed by an interpreter, who provides linguistic mediation during an encounter between parties without a common language. The Norwegian Interpreting Act regulates public bodies' responsibility to engage and use an interpreter to ensure adequate assistance and services for individuals who cannot communicate adequately in Norwegian. It also requires the use of a qualified interpreter (see section 1.1). In the Norwegian public sector, qualified interpreters have formal training and certification, and their credentials are registered in the National Registry of Interpreters. The registry defines qualification levels, and all listed interpreters meet the Act's requirements, thus supporting quality assurance, professional standards, and legal safeguards in interpreter-mediated encounters.

Decisions about the need for and use of language mediation in the public sector are evolving. Emerging technologies are creating new alternatives for real-time, technology-mediated interpreting that are influencing how multilingual communication is organised and supported. At the same time, digitalisation (particularly advances in artificial intelligence and automated language technologies) has expanded the range of tools available to public bodies. These developments raise new questions about how different forms of language mediation relate to existing practices, responsibilities, and quality requirements in public service contexts.

Recent technological developments challenge some established distinctions between interpreting and translation. In the strictest sense, automated, unrevised text-to-text renderings may resemble interpreting more than translation, as they are produced instantly. As a result, technology contributes to gradually blurring boundaries between forms of language mediation and human- and machine-assisted practices.

In practice, decisions about the use of interpreting technologies are often made in frontline services, where operational needs, time constraints, and available resources shape how tools are selected and deployed. These decisions are made within existing institutional and legal frameworks, which vary across sectors and contexts. Over time, they can influence legal safeguards, trust in public services, and the conditions under which professional interpreting is provided.

This report examines how emerging global technologies interact with established interpreting practices and with the Norwegian regulatory framework set out in the Interpreting Act. The Act defines public bodies' responsibility to ensure adequate communication, requires the use of qualified interpreters, and establishes principles for legal safeguards and quality in interpreter-mediated encounters. By analysing technological developments, market dynamics, and institutional conditions in relation to these commitments, the report presents future scenarios for public sector interpreting.[1] The aim is to support public bodies and other stakeholders in making informed, proportionate, and responsible decisions about the future role of technology in interpreting.

[1] In this report, we use the term public sector interpreting, which is the established designation in Norway. Although public service interpreting is more widely used internationally, we use "sector" to align with Norwegian practice and to underscore that this activity is situated within the public sector.

1.1 The legal framework

Public sector interpreting is regulated by the Act relating to public bodies' responsibility for the use of interpreters, etc., referred to in this report as "the Interpreting Act" or simply "the Act."[2] The purpose of the Act is "to uphold legal safeguards and ensure the provision of proper assistance and services to persons who are unable to communicate adequately with public bodies without an interpreter. The Act shall also help ensure that interpreters uphold proper professional standards." (Section 1. *Purpose*)

In section 6, *Responsibility for engaging an interpreter*, the Act further stipulates that:

> *Public bodies shall use interpreters when mandated by law. If the obligation to use an interpreter is not regulated in other legislation, public bodies shall use an interpreter if this is necessary to uphold legal safeguards or provide proper assistance and services. In the assessment of whether it is necessary to use an interpreter, weight shall be given to factors such as whether the parties to the conversation can communicate adequately without an interpreter, as well as the gravity and nature of the matter.*
>
> *A public body should consider the use of an interpreter when it is otherwise in contact with persons who are unable to communicate with the body in Norwegian.*

The use of the term "shall" in the text is significant. Public bodies are required to use an interpreter when this follows from specific legislation, or when it is necessary to uphold legal safeguards or provide proper assistance and services. The Act thus establishes criteria for when an interpreter should be used, while leaving considerable discretion to public body representatives to assess the need, based on factors such as the seriousness of the case and the requirements for proper communication. Although minority language users may, in many situations, have grounds to request an interpreter, in practice the decision rests with the public body, who also bears the cost of the service. In this way, the Act both regulates the conditions for using interpreters and creates the institutional demand for public sector interpreting.

Section 8 of the Act is of special relevance for the context of this report, as it explicitly assigns the public bodies the responsibility for ensuring that "satisfactory technical solutions are in place, that staff are adequately trained, and that personal data are protected" when using remote interpreting solutions. This is the only section specifically addressing the use of technology.

Section 9 introduces a requirement that "public bodies which regularly use interpreters shall have guidelines in place on engaging and using interpreters pursuant to sections 6 to 8". This requirement is not prescribed uniformly. Instead, such guidelines must be adapted to the public body's size, distinctive characteristics, activities, and risk factors. This implies that compliance is not merely a matter of formal guideline adoption, but of tailoring practices to organisational context and the potential consequences of inadequate interpreting.

This risk-based logic is central to the Act and will be used as an analytical point of reference in later chapters, where we examine how different public bodies interpret, operationalise, and prioritise the use of interpreters in practice. The Act also sets out criteria for who may work as an interpreter. The Act prohibits the use of children as interpreters (section 4) and requires that interpreters be qualified (section 7). Interpreters who meet the statutory qualification requirements can be registered in the National Registry of Interpreters, which provides a basis for public bodies to identify and engage qualified personnel. The regulation also creates sanctions and mechanisms for reporting unprofessional or unethical conduct among interpreters (§§19-21).

[2] https://lovdata.no/dokument/NLE/lov/2021-06-11-79.

1.2 Objective and scope of the report

This report examines the intersection of technological development and public sector interpreting, with the aim of identifying opportunities, limitations, and implications for policy and practice. The scope of the report is deliberately broad, covering technological trends, market developments, professional perspectives, and institutional conditions. At the same time, it is not intended to be a technical evaluation of specific tools, or a prediction of future adoption. Instead, the report provides a basis for reflection and discussion on how different technological pathways may evolve and what this might mean for legal safeguards, service quality, and professional practice.

Special attention is paid to public sector contexts where the consequences of communication failure are significant, and where decisions about the use of technology must be aligned with existing legal and ethical frameworks.

The main objectives are summarised as follows:

- Outline cross-cutting and specific emerging technologies that are likely to impact the field of interpreting
- Understand market trends (e.g., market growth, potential new markets, technology adoption by professionals) and demand for interpreting services in different sectors
- Explore the future role of human interpreters and how it might evolve in response to technological advances, and the opportunities for augmentation and automation
- Assess the potential impact and implications of these technologies on the quality, accessibility, challenges and risks associated with the use of new technologies in interpreting

In addition, the report discusses how digitalisation might affect interpreting in the public sector and assesses its potential overall impact on the training of interpreters and the management of interpreting services. The report provides insights, future scenarios, and strategic guidance for IMDi and other stakeholders to understand the potential of technological advances for further policy development and implementation.

During the initial scoping phase, and in agreement with IMDi, it was decided not to include Norwegian Sign Language in this study. Norwegian Sign Language is an official language in Norway with a legal status equal to Norwegian and the Sami languages, and it differs fundamentally in modality from the spoken minority languages covered by the National Registry of Interpreters. An independent follow-up study would therefore be needed to assess how the intersection of technological development and public sector interpreting may affect sign language interpreting.

2 Methodology

2.1 Horizon scanning

Our approach is anchored in foresight studies, specifically horizon scanning. We draw upon the OECD's definition of horizon scanning as "a technique for detecting early signs of potentially important developments through a systematic examination of potential threats and opportunities, with emphasis on new technology and its effects on the issue at hand." Horizon scanning encompasses a family of methods used to identify emerging trends, weak signals, and shifts in technological, social, or organisational conditions that may shape future developments. These methods are widely applied across domains (Doos et al., 2016; McCrickard & Rajic, 2014; OECD, 2006). Horizon scanning is also well established within public-sector planning and investment processes; the Ministry of Finance's Concept Research Programme describes it as a key tool for informing long-term choices and scenario development (Sager, 2017, p. 32).

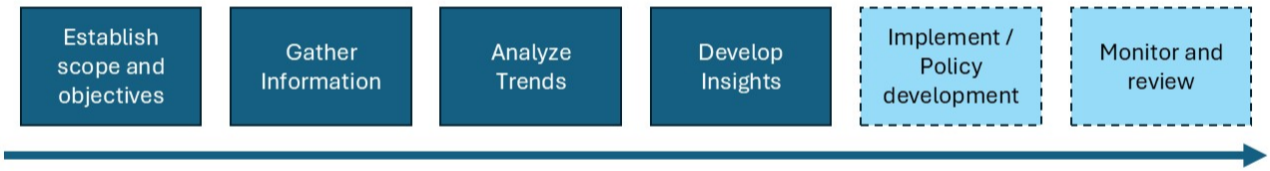

Figure 1 Overall process flow for the research in the project

Figure 1 shows the overall process flow of the research process. This is based on a traditional horizon-scanning process that works from left to right. The last two phases (implementation and policy development and field monitoring and review) are beyond the scope of this report.

The purpose of data collection was not to exhaustively document the current state of the field, but to identify early signals, emerging patterns, and plausible trajectories relevant to public sector interpreting. This approach also justifies the inclusion of grey literature and market actors.

2.2 Data collection

The data collection (gathering information) phase can be summarised as follows:

Table 1 Data collection summary

Data collection summary	
Research & policy literature	Including academic studies, grey literature, and public sector reports, to identify established findings, regulatory considerations, and documented trends relevant to interpreting.
Market and technology actors	Including providers of interpreting services and interpreting-related technologies, to capture early signals of technological development, feasibility, and emerging business models.
Professional and institutional perspectives	Drawing on practitioners, public sector stakeholders, and organised workshops, to ground the analysis in work practices, institutional constraints, and quality considerations.

To gather information on the **research and policy literature**, a literature review was conducted using standard searches in academic literature, public sector reports, and open sources on interpreting technology. Search terms were emerging technologies and interpreting; AI and interpreting; computer-assisted interpreting; remote interpreting; machine interpreting; digitalisation and interpreting; real-time interpreting devices; automation of interpreting/interpretation. Data sources were academic libraries such as Google Scholar, Scopus, and Web of Science; Directorate-General for Interpretation at the European Commission (DG SCIC); Directorate-General for Logistics and Interpretation for Conferences at the European Parliament (DG LINC); industry reports; news articles. Inclusion criteria were sources published in English and Norwegian; full-text available; and works published after 2015. An initial literature scan was conducted in the autumn of 2024 and has been continuously updated through the combined expertise of the authors.

Information on the **market and technology actors** was gathered by scanning reports from independent associations and consultancies that specialise in closely monitor the developments of the language and localisation industry. We identified and cross-checked the most recent reports (from 2024 and 2025), extracted a list of market actors offering interpreting services and visited their websites for further information (types of language services and products they offer, domains and sectors they support, clients, etc). The full list of sources for the scan is available in Appendix A: Sources for market scan.

This was followed by a series of interviews with selected companies, including businesses operating in and supplying products and services to public and private sector organisations in Norway, to gain insights and provide input for the subsequent trend analysis and scenario development. These actors were included because they are directly involved in the development, deployment, or integration of interpreting technologies, and can therefore provide practical insight into current solutions, emerging directions, and perceived constraints in the field. A total of six companies from Norway, the Nordic countries, Europe, and the United States participated in semi-structured interviews, in some cases over several rounds. Interviews were conducted with one or two senior executives per company, most of whom held roles related to technology, strategy, or market development. The interviews were systematically documented through recordings, transcripts, and independent notetaking. They focused on the companies' products and services, the use of AI in their offerings, perceived risks and mitigation measures, and anticipated implications for the interpreting market and the interpreting profession. Before contacting interviewees, a data collection application was submitted to SIKT.[3] The results of the market scan and the interviews are presented in chapter 4.

The professional and institutional perspective was explored through **a set of workshops** with relevant actors. This included various public sector bodies that use interpreters (police, immigration authorities, welfare services, schools, hospitals), an interpreters' association, public and private interpreting agencies. During the workshops, the researchers presented preliminary findings and analyses and collected data through focus groups, world café methods, and interviews. Two one-day workshops were conducted in November 2024 and May 2025. Workshop 1 was later analysed and reported back to the participants and IMDi, while Workshop 2 identified key pain points and future scenarios. The results were not published but served as a foundation for the scenarios and recommendations in this report.

[3] SIKT is the Norwegian body responsible for supporting the research community in matters related to data management and GDPR. All research projects that process personal data must contact SIKT for an assessment of privacy before beginning data collection.

2.3 Analysing trends

The analysis of the collected material was guided by an explicit focus on public sector interpreting as a form of skilled, time-critical work. Rather than treating interpreting as a generic language service, the analysis approached it as a work process with limited opportunity for revision, limited preparation time, and potentially serious consequences in the event of an error. This analytical perspective was developed through collaboration between the research partners and based on their complementary expertise in interpreting studies, interpreter education, interpreting technologies, the wider technological context, work, and organisational processes.

On this basis, the collected material was analysed to identify recurring patterns and emerging developments relevant to interpreting practice. Trends were assessed in terms of their potential impact on interpreting as a professional activity, their implications for risk, the institutional contexts in which they may be applied, and the time horizons over which their effects are likely to unfold. Attention was given to developments that blur established boundaries between preparation and performance, human and machine agency, and support and substitution.

The outcome of this analysis is a structured set of emerging trends and technological trajectories relevant to public sector interpreting. These trends do not represent predictions of future outcomes, but plausible directions of change that may interact in different ways depending on regulatory choices, organisational practices, and risk tolerance. They form the analytical basis for the scenario development presented in chapter 7, where alternative futures for public sector interpreting are explored.

3 Technologies shaping the future of interpreting

Technology has significantly expanded the range of tools available for multilingual communication. Although there is no single, unified "interpreting technology," advances across multiple domains, including artificial intelligence, natural language processing, automation, and their integration into new digital devices, have reshaped the technological landscape of interpreting.

The impact of these developments varies widely by context and function, particularly in the field of public sector interpreting, where different technologies can enhance different aspects of the interpreting process. Overall, technology is widely recognised as a key driver of change in interpreting, notably through the three well-established and broad classes of computer-assisted interpreting (CAI), remote interpreting (RI), and machine interpreting (MI) (Fantinuoli, 2018). The three are discussed in sections 3.4.1, 3.4.2 and 3.4.3. In addition, technologies that manage the administrative workflow of interpreter-mediated encounters, such as interpreting management systems, have more recently entered the field.

This chapter provides an overview of the major technologies that are already shaping the future of interpreting, and some that are expected to continue to do so.

Interpreting modes, i.e., the ways interpreting is performed, vary from situation to situation. One important distinction is between the **simultaneous** and **consecutive** modes (Pöchhacker et al., 2015).

In **simultaneous** interpreting, the interpreter renders the message into the target language as the speaker delivers it, typically using technical equipment such as booths or portable headset systems (known as "*bidule* interpreting"). In the Norwegian public sector, this mode is mainly used in courtrooms and larger meetings and is well-suited to the use of technological aids.

In **consecutive** interpreting, the speaker and the interpreter take turns. In the public sector, consecutive often takes the form of dialogue interpreting, where the interpreter works back and forth between languages in short turns during face-to-face interaction.

This mode typically involves minimal technology use due to confidentiality and interaction considerations.

The first half of the chapter is primarily descriptive, outlining at a broad level what these technologies are, how they work, and how they are currently used or being developed in relation to interpreting. The second part discusses their effects and implications.

3.1 Artificial intelligence and natural language processing

Artificial intelligence (AI) broadly refers to computational systems designed to perform tasks that typically require human cognitive abilities, such as perception, reasoning, and language use. Within AI, natural language processing (NLP) is the subfield concerned with the automatic analysis, understanding, and generation of human language, in both written and spoken form. NLP provides the methodological and technological foundation for many language-related applications relevant to interpreting, including automatic speech recognition (ASR), machine translation (MT), and text-to-speech synthesis (TTS).

Recent advances in AI, particularly in large language models (LLMs), have significantly expanded the capabilities of NLP systems. These models, typically based on transformer architectures, represent a shift away from earlier rule-based or purely statistical approaches by enabling more context-sensitive output, improved handling of ambiguity, and more flexible integration of external knowledge sources through techniques such as retrieval-augmented generation. As a result, NLP systems are increasingly able to model longer contextual dependencies and produce more linguistically and pragmatically coherent output.

These developments have led to significant advances in all three areas (automatic speech recognition, machine translation and text-to-speech synthesis), all of which are central to interpreting. In the context of interpreting-related technologies, particularly computer-assisted interpreting (CAI) and machine interpreting (MI) tools, this results in more accurate and robust transcription, improved disambiguation of homophones and domain-specific terminology, and an enhanced ability to process longer and more complex sequences of speech in real time.

A particularly novel and relevant development is multimodal modelling, in which AI systems integrate linguistic input with information from other modalities, such as vision or non-verbal audio cues. This capability enables systems to process video signals, recognise objects, and incorporate non-verbal information alongside speech recognition output, potentially increasing the quality and robustness of machine interpreting (Fantinuoli, 2025b). This is not limited to large language models. As early as 2020, it was noted that multimodal natural language processing (MLNLP) approaches also open up applications such as interpreting support for signed languages and enhanced forms of video-mediated communication (Camgoz et al., 2020). The field has advanced considerably since then.

Large language models are not standalone systems but rather enabling technologies that underpin a wide range of tools central to interpreting, including computer-assisted interpreting tools and, more recently, machine interpreting systems. LLMs have been integrated into commercial speech translation platforms. Examples include Google Live Translation, Microsoft Translator/Teams, Speechify, Interprefy and KUDO AI. The list is not exhaustive, and more examples are likely to emerge in the future, since this is an expanding field of technology. Some, like KUDO AI (Fantinuoli, 2024), move beyond traditional machine translation by using LLMs to improve translation in ways that surpass conventional linear (word-for-word) approaches.

3.2 Automation technologies and workflow technologies

The automation of work processes is widely regarded as a key driver of efficiency and accuracy gains. Broadly speaking, this encompasses technologies such as robotic process automation (RPA), workflow management systems, and decision support systems, which can automate or partially automate routine tasks and structured decision-making processes.

In the context of interpreting, these technologies affect two main areas. The first concerns the interpreting process itself. Automation can be applied to augment interpreters, for example, during training, through computer-assisted interpreting training tools that provide customisable natural-sounding speeches for practice (Valledor et al., 2025), or during live interpreting (Fantinuoli, 2017), in the form of computer-assisted interpreting tools and, in some cases, fully automated interpreting systems. The second area relates to back-office and organisational functions, such as booking, scheduling, preparation, and other “offline” activities. These processes can be automated to varying degrees, including the assignment of interpreters and the distribution of preparatory materials, and are typically supported by interpreting management systems.

At present, the number of tools aimed at augmenting interpreters (CAI) is relatively limited and is largely concentrated among a small number of specialist providers. A similar situation applies to interpreting management systems, which are often developed in-house by organisations or institutions that manage a high volume of interpreting assignments. The availability of commercial off-the-shelf products remains limited. By contrast, the landscape is markedly different with respect to the full automation of the interpreting process (MI), where a large and growing number of applications, targeting both the consumer and enterprise markets, are already available.

3.3 Convergence of digital technologies

Rather than the emergence of any single technology, one of the most consequential developments affecting interpreting is the convergence of multiple digital technologies into integrated, affordable, and widely accessible systems. Advances in computing power, networking, and cloud infrastructure mean that components such as automatic speech recognition, speech-to-text conversion, text-to-speech synthesis, neural machine translation, graphical user interfaces, and cloud-based processing can be combined into unified tools that operate seamlessly in real time.

This technological convergence is particularly evident in everyday consumer applications. Contemporary speech translation applications on smartphones, for example, allow users to speak into a device and receive an almost instantaneous spoken or written rendition in another language through applications such as Google Translate, Microsoft Teams and Apple's AirPods, to name just a few. These applications rely on tightly coupled pipelines in which speech recognition, language processing, and speech synthesis work together, made possible by advances in machine learning and the widespread availability of personal digital devices. These systems are increasingly incorporating multimodal capabilities, such as image and video processing, object recognition, and contextual information integration. This allows language output to adapt to situational and communicative cues.

From an interpreting perspective, this convergence has implications that go beyond technical performance. As integrated language technologies become embedded in everyday communication practices, they reshape expectations regarding access to multilingual communication, particularly for speakers of minority languages interacting with public services. In this sense, convergence contributes to a gradual reconfiguration of how interpreting is understood, accessed, and practised, thereby blurring the traditional boundaries between human-mediated interpreting, technology-supported interpreting, and fully automated language services. At the same time, it creates new technical opportunities for interpreters and other stakeholders to use these technologies to support and enhance professional practice and organisational workflows.

3.4 Established and emerging interpreting-specific technologies

3.4.1 Computer-assisted interpreting tools

Computer-assisted interpreting (CAI) tools are digital systems designed to support human interpreters before, during, and after an assignment. They do this by improving information management, reducing cognitive load, and enhancing overall performance. CAI tools are software solutions that assist interpreters with specific subtasks of the interpreting workflow, such as preparation, terminology retrieval, and real-time problem-trigger management, while the actual interpreting remains the responsibility of the human professional. Rather than automating interpreting, these tools augment interpreters' cognitive and operational capacities through functionalities such as glossary management, document processing, terminology extraction, and ergonomic interfaces for quick lookup. Early generations of CAI tools mainly focused on preparation, providing interpreters with efficient ways to compile, store, and rehearse specialised terminology and conceptual knowledge, a crucial phase in bridging linguistic and domain-specific gaps.

Recent advances in artificial intelligence, and particularly in automatic speech recognition (ASR), have significantly expanded the scope of CAI tools. Already in 2017 Fantinuoli pointed out that modern solutions now integrate highly accurate, speaker-independent ASR engines capable of generating real-time transcripts and automatically identifying problem triggers such as numbers, proper names, and specialised terminology (Fantinuoli, 2017). This remains the case today (Prandi, 2025). Empirical studies show that these features can improve the accuracy and stability of simultaneous interpreting by alleviating the cognitive burden

associated with retrieving difficult items under time pressure (cf. Defrancq & Fantinuoli 2021, Li & Chimiel, 2024). Similar gains have been documented in consecutive and dialogue interpreting, where tablets and mobile devices enable interpreters to combine digital note-taking, glossary consultation, and access to event-specific documentation (cf. Ünlü, 2025). The analysis of how such tools may benefit public sector interpreting remains under-explored. Nevertheless, initial empirical studies suggest performance improvements can also be achieved in this setting (cf. Tan et al., 2025). Although challenges remain, such as managing latency, preventing overload from non-selective term suggestions, or ensuring ergonomic design, evidence consistently indicates that CAI tools can enhance performance without compromising interpretive quality when used appropriately.

As CAI tools evolve, large language models (LLMs) are expected to further transform information workflows. LLMs can personalise preparatory materials, generate domain-specific glossaries, and organise large quantities of online information tailored to the interpreter's past usage patterns. Despite these opportunities, integration into interpreter education and professional practice is still uneven, and concerns about overreliance and cognitive impact persist. Nevertheless, CAI tools represent one of the most mature and widely accepted forms of technological support for interpreting. They are a clear example of augmentation in which technology strengthens human expertise rather than replacing it.

3.4.2 Remote interpreting technologies

Remote interpreting (RI) refers to the delivery of spoken or signed interpreting services via telecommunication technologies, enabling interpreters to work from a location that is different to that of the speakers and listeners. The main factors that distinguish remote interpreting from face-to-face interpreting are the reduced level of social presence and the limited availability of contextual and non-verbal information beyond that which can be perceived through the medium. There is also a strong reliance on technology and stable network connectivity. Remote interpreting encompasses several modes, the most notable of which are video remote interpreting (VRI), telephone interpreting, and remote simultaneous interpreting (RSI).

Remote interpreting is a form of interpreting in which the interpreter is not physically co-present with all or some of the parties, and the interpreting process is facilitated through technological platforms.

Both **telephone interpreting** and **video interpreting** are examples of remote interpreting.

In Norway, remote interpreting is common in a wide range of public service settings, from court meetings to medical appointments and immigration interviews.

Telephone interpreting provides interpreting via audio-only channels and is particularly suited to quick, on-demand communication in healthcare, legal, and customer service contexts. Due to its widespread adoption, particularly within the public sector, future developments in remote interpreting are more likely to focus on video remote interpreting and remote simultaneous interpreting than on telephone interpreting itself. Recent innovations include mobile app access, workflow integration, and AI-enhanced call routing, driven by regulatory requirements and growing multilingual service needs.

Internationally, remote interpreting is now used in public sector interpreting to varying degrees across institutions and countries. Although RI has existed for years, initially through telephone interpreting and later through video-mediated solutions (Braun & Taylor, 2012), its uptake accelerated markedly during the COVID-19 pandemic. For example, in response to COVID-19 restrictions, the Public Employment Service of Greece introduced tele-counselling services that incorporated remote interpreting for non-Greek-speaking beneficiaries (Ioannidis & Vlachopoulos, 2024). Industry analyses also suggest that remote modalities represent a substantial share of the post-pandemic interpreting market. Nimdzi reports an approximate

near-even split between on-site and remote interpreting in its post-pandemic market discussion, and notes continued growth of video remote interpreting and telephone interpreting (Hickey, 2023; Janaszkiewicz, 2025). Research on RI in public sector interpreting has a long tradition and covers, among other aspects, interpreters' perceptions of remote work and its impact (Corpas Pastor & Gaber, 2020), interpreters' working experiences and stress factors in VRI contexts (Klomfar et al., 2025), training and capacity-building for working effectively with remote interpreters (Domingo et al., 2023), and practical implementation and management of remote public sector interpreting services under pandemic conditions (René de Cotret et al., 2020). The popularity of RI is significant in in Norway as well. In Norwegian public sector interpreting, telephone interpreting is the dominant mode, accounting for over 70% of assignments.

Video remote interpreting uses videoconferencing platforms to connect interpreters with clients in real time. It is widely used in healthcare, legal, and educational settings, where visual access is essential, particularly for sign language interpreting and for managing nuanced interaction. Research has highlighted the importance of non-vocal components of communication in VRI, including visual cues, turn-taking behaviour, and the management of emotional dynamics (Amato et al., 2018). Factors such as the interpreter's rate of speech and the emotional state of the client can significantly affect interactional flow, with high speech rates potentially leading to repetitions and disruptions in turn-taking. As a result, communication beyond words (encompassing vocal and visual resources) has increasingly been incorporated into the training of remote interpreters. Recent technological developments include the integration of telehealth systems, AI-assisted captioning, and ultra-low-latency audio. These developments contribute to more seamless deployment in emergency and hybrid settings. Surprisingly, VRI only accounts for two per cent of assignments in Norway, despite significant efforts by IMDi to promote and increase its use. The exact statistics on the usage of VRI in public sector interpreting is unknown, but it if Nimzdi's figures on the growth of are correct, it would seem that usage in Norway is low.

Remote simultaneous interpreting enables interpreters to render speech in real time during virtual or hybrid meetings, conferences, and events, using specialised cloud-based platforms such as Interprefy[4] or KUDO.[5] Unlike some forms of traditional remote interpreting, where the interpreter may still be physically co-located with one of the parties, remote simultaneous interpreting allows interpreters to work independently of the speakers' and listeners' physical locations. Remote simultaneous interpreting solutions typically consist of two main components: an interpreting management system, responsible for assignment scheduling and management, and an interpreting delivery platform supporting the actual delivery of the interpreting. This technology has expanded rapidly in response to global remote working trends, offering cost efficiency, scalability, and AI-supported features such as real-time transcription and multilingual captions. However, challenges remain with regard to sound quality, cognitive load, and interpreter fatigue, underscoring the need for robust technology and ergonomically appropriate working conditions.

More generally, recent technological affordances have altered the traditional understanding of interpreting as an activity that takes place strictly "here and now." As Pöchhacker (2022) notes, interpreters may increasingly operate within fragmented virtual spaces and rely on digital transmission, recording, and replay technologies, thereby reshaping both the temporal and spatial dimensions of interpreting. In response to these developments, interpreting hubs, especially for simultaneous interpreting, have been proposed as a potential future workspace model (Ziegler & Gigliobianco, 2018). Such hubs could provide ISO-compliant

[4] https://www.interprefy.com.

[5] https://www.kudo.ai.

technical infrastructure, on-site technical support, and shared workspaces, allowing interpreters to work remotely while benefiting from improved working conditions and professional exchange.

Finally, the rapid uptake of videoconferencing across sectors has lowered the threshold for using remote interpreting solutions in public services. Alongside general-purpose video platforms such as Zoom[6] and MS Teams,[7] specialised interpreting platforms, such as Boostlingo[8] and LanguageLine,[9] have emerged, offering real-time multilingual support for healthcare and other sectors.

The development and implications of remote, technologised interpreting have been the subject of several publicly funded research initiatives. Notably, EU-funded projects such as Avidicus I–III examined video-mediated interpreting in legal proceedings, resulting in practical guidelines for bilingual videoconferencing in the justice sector. Subsequent projects, including SHIFT (2015–2018) and ReTrans (2022–2024), have extended this line of research to humanitarian and transborder migration contexts.

3.4.3 Machine translation and speech translation

Written machine translation (MT) plays a significant role in the interpreting ecosystem for two main reasons. Firstly, it is widely used in domains such as healthcare as a practical tool to facilitate multilingual communication and comprehension, even during face-to-face encounters (Valdez et al., 2025). Secondly, MT is a core technological component of interpreting-related technologies, particularly computer-assisted interpreting (CAI) and machine interpreting (MI) tools (Fantinuoli, 2023).

Historically, machine translation research aimed at fully automatic translation systems. Over time, however, the focus also embraced approaches that integrate MT into human-centred workflows, notably computer-assisted translation, and computer-assisted interpreting. In these approaches, MT is primarily conceived as a support technology that complements human expertise rather than replacing it (O'Hagan, 2019).

From a technological standpoint, MT has evolved significantly over the past few decades. Early statistical approaches, which were dominant in the 1990s and 2000s, relied on probabilistic models that were trained on large collections of translated texts. While these systems were an improvement on rule-based methods, which had been the norm until then, they were limited in their ability to handle context, ambiguity, and fluent language production. Since the mid-2010s, neural machine translation (NMT) has become the dominant paradigm, enabling more context-sensitive, fluent, and robust translations and forming the basis of most contemporary MT systems (Wu et al., 2016).

More recent developments extend beyond sentence-level translation. These include context-aware and document-level MT, improved performance for low-resource and minority languages, and zero-shot translation, which allows translation between language pairs with little or no dedicated training data. Such advances are especially important for language combinations commonly encountered in public sector interpreting, where resources are often scarce (AI at Meta, 2025).

Besides being used directly by practitioners to overcome language barriers, NMT are a key component of so-called cascading interpreting systems, which integrate MT with automatic speech recognition and text-to-speech technologies, enabling the translation of spoken language into a written or oral form in the target language. While more recent approaches perform end-to-end speech translation without relying on

[6] https://www.zoom.com.

[7] https://www.teams.live.com.

[8] https://www.boostlingo.com.

[9] https://www.languageline.com.

intermediate written transcripts (Nachmani et al., 2023), written machine translation remains a key component of most current machine interpreting systems (see next section).

Overall, these developments move machine translation beyond a purely text-based technology and closer to machine interpreting, with boundaries not always easy to define, either technically or in terms of the user perspective.

3.4.4 Machine interpreting (speech-to-speech translation)

Machine interpreting (MI) refers to the automated process of converting spoken utterances from one language into another in real time. It is a specific application within the broader field of speech-to-speech translation, distinguished by its focus on immediacy and live communication. Unlike other applications of speech translation technology, which may include offline processing, subtitling, or dubbing, MI is built for situations where the translation must be delivered once, with limited opportunity for revision, mirroring the temporal constraints of human interpreting (Fantinuoli, 2025a). Its purpose is to enable direct multilingual communication in settings such as conferences, meetings, public services, or any scenario in which participants speak and interact spontaneously.

From a technological perspective, MI can operate in two modes: consecutive, where the system translates after a speaker finishes a sequence (a sentence, a thought, etc.), or simultaneous, where the translation is generated incrementally as the speaker continues to talk. These modes rely on different system architectures. Most current systems use a cascading approach, combining automatic speech recognition, neural machine translation or large language models, and text-to-speech synthesis. More recent developments aim towards end-to-end models that translate speech directly into speech without intermediate text, enabling the preservation of prosodic, paralinguistic, and emotional features of the original delivery. Both architectures reflect different technological trade-offs around latency, accuracy, robustness, and scalability (Sperber & Paulik, 2020).

Machine interpreting (MI) is not only a technological solution but also represents an extension of interpreting practices through automated language technologies. By automating core interpreting functions, MI offers the prospect of more accessible, scalable, and lower-cost multilingual communication. Its main potential lies in providing language access in situations where human interpreters are unavailable, impractical, or unaffordable, thereby helping to mitigate persistent linguistic barriers in the public sector.

At the same time, MI inherits many of the linguistic, cultural, and ethical challenges associated with both interpreting and AI-based systems. These include difficulties in handling speech disfluencies, culturally embedded references, turn-taking dynamics, contextual meaning, latency, and algorithmic bias. In addition, widely accepted frameworks for evaluating the quality, reliability, and appropriateness of MI output are still lacking, particularly regarding accountability, transparency, and risk management. As a result, the balance between potential benefits and limitations remains insufficiently explored and calls for careful assessment, especially in high-stakes contexts such as public sector interpreting.

3.5 Future developments: extended reality and multisensory environments

Extended reality (XR) technologies, including virtual reality (VR), augmented reality (AR), and mixed reality (MR), enable digital visual environments or overlays that can simulate co-presence, provide contextual information, or enhance the user's field of view. Unlike the technologies discussed in the previous sections, XR is not yet applied in a systematic or widespread manner within the current interpreting ecosystem. Nevertheless, these technologies are increasingly being explored in relation to interpreting, particularly in contexts where spatial information, immersive simulations, or enhanced visual access may support communication or training activities (Baselli, 2025) (Universidad de Salamanca et al., 2025).

VR systems create fully immersive environments using head-mounted displays or 360-degree video feeds. For interpreting, this includes the possibility of adapting visual input to the interpreter's needs, for example, through adjustable viewpoints or panoramic video. Developments in 360-degree cameras and spatial video could allow interpreters to access a broader or more flexible visual field than standard video conferencing systems.

AR and MR technologies superimpose digital information onto the real environment, enabling interpreters to access supplementary materials or visual cues while remaining connected to the physical setting. Research prototypes have explored blending real-world views with virtual elements, where mixed reality solutions embedding terminology prompts, contextual cues or spatial annotations into the interpreter's visual field have been proposed and experimented with as the next logical step towards practical use of such technology in interpreting (Ziegler & Gigliobianco, 2018).

The most considerable effort (and potential benefit) within this field lies in training and education. Virtual co-location and the creation of an experience can be used to provide realistic training or enhance on-the-job training. This is also shown in some of the major EU-funded projects on interpreter training (IVY and EVIVA). IVY, for instance, gave several interpreter training scenarios in a 3D virtual world where users could practice interpreting oral interaction between avatar actors (Ritsos et al., 2013). The QUAIT project at Zurich University of Applied Sciences has recently secured funding from the European Parliament to pilot a fully AI-mediated conference interpreting scenario, where OsloMet is among the participant institutions.

3.6 The AI Act and the need for risk analysis

There is an increasing attention towards the regulation of AI technology. One of the most significant recent developments in this area is the European Union's AI Act, which will also become relevant in this context. The Act is fundamentally risk-based, with regulatory obligations increasing according to the level of risk an AI system poses. It distinguishes between four risk categories.

Figure 2 EU Artificial Intelligence Act Four Levels of Risk. Source: https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

Public sector interpreting is often linked to access to and quality of public services, as well as to migration, asylum and border control, justice, and democratic processes (all of which are listed as examples of high-risk use cases). When machine-interpreting systems are used in such contexts, they are likely to fall within the AI Act's high-risk category. This entails that AI providers must:[10]

[10] List from EU High Level summary of AI Act, see High-level summary of the AI Act | EU Artificial Intelligence Act, accessed latest 20251114.

- Establish a **risk management system** throughout the high-risk AI system's lifecycle.
- Conduct **data governance**, to ensure that training, validation and testing datasets are relevant, sufficiently representative and, to the best extent possible, free of errors and complete according to the intended purpose.
- Draw up **technical documentation** to demonstrate compliance and provide authorities with the information to assess that compliance.
- Design their high-risk AI system for **record-keeping** so that it automatically records events relevant to identifying national-level risks and substantial modifications throughout its lifecycle.
- Provide **instructions for use** to downstream deployers to ensure they comply.
- Design their high-risk AI system in such a way that it allows deployers to implement **human oversight**.
- Design their high-risk AI system in such a way that it achieves appropriate levels of **accuracy, robustness, and cybersecurity**.
- Establish a **quality management system** to ensure compliance.

This list outlines requirements that any public sector organisation can verify with a provider when procuring and deploying automated translation or interpreting tools. Acquiring a technically and legally compliant system is necessary, but not sufficient. The technology must also be used responsibly in practice, and this responsibility rests with the organisation and professionals using the tool.

The key element in responsible use is *effective human oversight*. As discussed above, however, determining when and how such oversight should be exercised is not straightforward and often requires structured guidance. There are several such guides on the global market developed by interpreter associations, international organisations, and language service providers. Examples include the International Association of Conference Interpreters' (AIIC) *AI Decision tree*,[11] The European Union's DG Interpretation *AI guidance for interpreters*,[12] the Global Interpreting Network's *Machine translation vs. human translation*,[13] and Boostlingo's *Decision framework for AI risk* (Figure 3 Boostlingo decision framework for AI risk 2024, an example of risk management in interpreting. The list is not exhaustive, and the guides vary considerably in style, content, and target audience. Nevertheless, they all seek to answer the same fundamental question: when can automatic interpreting be used, and when should it not be used? A definitive answer does not exist, but the purpose of all these guides is to encourage interpreting users to reflect on different settings, and on the factors that determine whether machine use is appropriate. As the AIICs notes, the aim of its *AI Decision Tree* is to "guide interpreters in advising their clients on the scope of Automatic Speech Translation (AST) across various scenarios".

[11] https://aiic.org/company/roster/companyRosterDetails.html?companyId=13909&companyRosterId=120.
[12] https://knowledge-centre-translation-interpretation.ec.europa.eu/en/content/dg-interpretation-ai-guidance-interpreters.
[13] https://globalinterpreting.com/blog/machine-translation-vs-human-translation-when-to-use-each-for-your-business/.

Below, we present the Boostlingo framework as an illustrative example. This framework was identified in autumn 2024, and participants at the first workshop recognised it as a relevant example that provided useful questions and decision-making guidance for the use of AI.

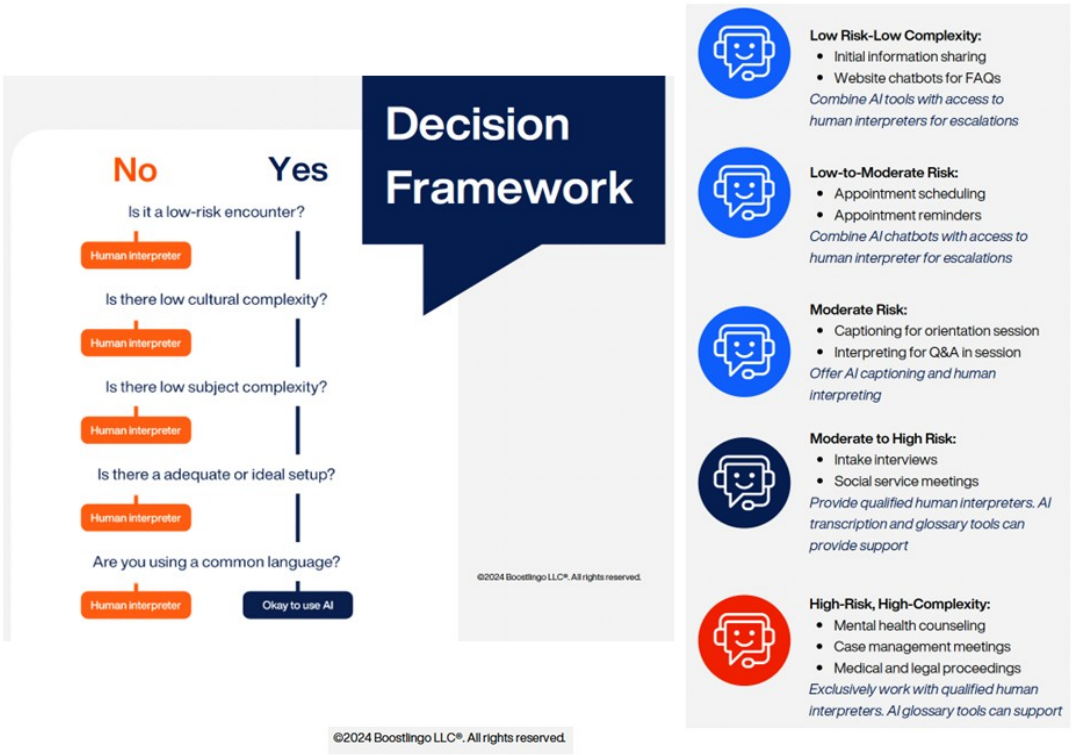

Figure 3 Boostlingo decision framework for AI risk 2024, an example of risk management in interpreting

Boostlingo is an international interpreting service provider. Its decision framework is an example of a system used to determine whether to involve a human interpreter in the process. Like the AI Act, it is risk-based and focuses on the risk of using AI in interpreting.

The Boostlingo framework also highlights two features that are not immediately apparent. Firstly, it introduces a temporal dimension, acknowledging that a situation may prove more complex than initially assumed during an encounter, thereby requiring the original decision to be reconsidered. Secondly, it clarifies the intended user group: the framework is not designed for interpreters themselves, but for those responsible for deciding when and how interpreting resources should be deployed. Used in this way, the framework can support public sector employees in determining when automated translation may be appropriate and when the involvement of a human interpreter is necessary.

This reflects a broader principle: although AI tools may be verified as compliant with the AI Act, , the responsibility for ensuring their appropriate use ultimately lies with the user. In high-risk contexts, this responsibility cannot be delegated to the technology itself; rather, it must be actively managed by a competent organisation with the capacity for informed oversight.

4 Insights from the market

4.1 The global interpreting industry landscape

We conducted a market scan of companies in the interpreting industry to gather insights into the current state of the market. According to the 2025 Nimdzi Interpreting Index report[14], the interpreting sector accounted for slightly more than 16% of the entire language services market in 2024. Furthermore, its growth projection exceeds that of the language services industry as a whole by a significant margin.

We initially conducted our scan in autumn 2024 and updated it in autumn 2025. The sources are listed in Appendix A: Sources for market scan. The results of scanning the market for companies that develop and provide interpreting services are summarised in the table below. The list is not exhaustive and has been anonymised. We have chosen not to include names because the market and the services offered are changing quickly. The purpose of this is to provide an indicative overview.

The table lists companies that specialise in products and services such as telephone interpreting, also known as over-the-phone interpreting (OPI), video remote interpreting (VRI), remote simultaneous interpreting (RSI), machine translation/artificial intelligence translation (MT/AIT), and computer-supported interpreting (CAI). The table also lists the domains (verticals) in which these companies offer their services and products, as well as the countries where they have their headquarters.

Table 2 Market scan interpreting industry[15]

	OPI	VRI	RSI	MT/ AIT	CAI	Domains	Country	Comments
1*	X	X	X	X		healthcare, legal, non-profit, education, government	US	Interpreting is the core business.
2*			X	X		conferences, business, governments, multilingual events, and meetings	CH	Interpreting is the core business.
3			X	X		conferences, business, governments, multilingual events and meetings	US	Interpreting and translation provider.
4				X	X	software for interpreters	DE	Interpreting is the core business.
5*	X	X		X		public sector, government	NO	Interpreting is the core business.
6			X	X		government, business, events, multilingual events, and meetings	LT	Interpreting is the core business.
7		X				education, financial services, healthcare, manufacturing, media and events, professional services, public sector	US	Interpreting is the core business. Sign languages.
8	X	X	X	X		healthcare, legal offices, financial services, insurance, government, education, energy & utilities	US	Interpreting is the core business. Translation and localisation.
9	X		X	X		healthcare, government, banking, insurance, hospitality	US	Interpreting is the core business. Translation and localisation.
10	X	X	X			Healthcare	US	Interpreting is the core business.

[14] https://www.nimdzi.com/preliminary-findings-from-the-2025-nimdzi-interpreting-index/.

[15] Companies marked with an asterisk (*) participated in this project's interviews. Note: Additional companies were also interviewed but are not included in this table. These companies were not identified in the initial scan; however, because they are active in Norway, we subsequently contacted them.

11	X	X	X			healthcare, insurance, government	US	Interpreting is the core business; in July 2025, it was acquired by company 8.
12		X				public sector, healthcare	AT	Interpreting is the core business.
13	X	X	X	X		healthcare, government, education	US	Interpreting is the core business.
14					X	speech recognition for automatic lookup of glossaries	US	Interpreting is the core business. Translation and localisation.
15	X	X		X		public sector	SE	Interpreting is the core business.
16	X	X	X			Healthcare	US	Interpreting is the core business.
17	X	X	X			healthcare, legal, government, business, customer support	US	Interpreting is the core business. Supports ASL.
18	X	X	X			public sector, government, technology & IT, legal, finance, medical	SE	Interpreting. Translation & localisation.
19	X	X	X	X		banking & finance, games, industrial manufacturing, legal services, life sciences	US	Interpreting. Translation & localisation
20		X	X	X		public and private sector	CA	(Governmental body) interpreting. Translation & localisation.
21	X	X	X			healthcare, life sciences, legal & IP, government, finance	US	Interpreting. Translation & localisation
22					X	Healthcare	AU	Interpreting is the core business.
23	X	X	X	X		finance, legal, medical, technical, marketing	BE	Interpreting. Translation & localisation.
24	X	X		X		healthcare, government & social services, education, legal	US	Interpreting. Translation & localisation.
25				X		manufacturing, media & entertainment, non-profits & NGOs	UK	Translation is the core business. Dubbing.
26				X		legal, business, medical, media, technical, automotive	ES	Translation.
27			X			government, meetings, education, church, business	US	Translation (including voice translation).
28				X		general purpose	US	Voice translation.
29				X		general purpose	US	Voice translation.

The official websites of each of the companies included were also taken into consideration when identifying their products/services and customers.

Of the twenty-nine companies, twenty-four have interpreting as their core business, while the remaining five focus on translation services and products. Of the twenty-four companies in the interpreting market, fourteen (58%) have already incorporated MT/AIT into their services, indicating a trend towards the rapid adoption of such technologies. According to the 2025 Nimdzi Interpreting Index report (Janaszkiewicz, 2025):

> That said, AI is seeping into interpreting in two ways: it can help reduce the need for human involvement in non-critical discussions (for instance, with appointment booking interactions in patient journeys) and provide – limited but useful – multilingual support where human interpreters are not available or affordable.

In essence, AI is on the rise and is making a cautious, selective entry into the interpreting industry. So far, it has been adopted primarily in low-risk situations where speed and cost savings are more important than nuance and precision. Although the technology shows potential in certain applications, machine

interpreting still struggles with major reliability challenges, ranging from lag to misreading context. This makes it unsuitable for high-stakes communication. At this stage, AI is serving as an aid rather than a disruptor. Consequently, many providers are testing hybrid approaches, in which human interpreters oversee AI-generated output, to combine efficiency with quality assurance. For now, AI is broadening access to interpreting services without fundamentally reshaping the profession.

4.2 Consumer goods and services for interpreting

This report focuses primarily on companies that develop and deliver interpreting services. However, the market also includes actors that provide more general AI solutions and services. Even if they do not have a particular interest in the interpreting and translation industry, many of these companies offer language-related software, and their products are widely used and well known. Google Translate is one example of a text-based translation tool. Large language models and generative AI are also at the core of consumer-oriented solutions, and their capacity to translate text is well established.

Other companies integrate similar translation technologies into a variety of products. Samsung and several other mobile phone brands offer automatic translation on some of their mobile devices, while Apple's AirPods feature a translation function that evokes the well-known "Babelfish" translator from the 1978 science-fiction classic *The Hitchhiker's Guide to the Galaxy*. These technologies are already available and widely recognised, and the companies that develop them (and the devices themselves) are likely to influence public sector interpreting.

We have not conducted a scan of these devices, as such an exercise would produce an extensive list of products that would likely become outdated almost immediately after the publication of the report. Instead, we have focused on companies that primarily offer services tailored to the interpreting market. Notwithstanding this, these companies and the translation devices they develop should be monitored, as they as they may indirectly shape the interpreting scene in significant ways.

4.3 Interviews with selected companies from the interpreting market

Interviews with companies in the interpreting industry revealed that organisations across the market share similar goals. They aim to reduce language barriers in communication and make interpreting more accessible, particularly given the persistent shortage of highly skilled interpreters. According to these actors, shortages are common: in some contexts, over 90% of interpreting touchpoints lacked access to an interpreter. Often, this forced interpreting users to rely on untrained or unauthorised individuals, or on unreliable technological solutions.

Participants emphasised that the demand for interpreting services, particularly in Europe, far exceeds the supply of qualified professionals. Estimates indicate that demand is up to ten times higher than the available interpreter capacity. Considering this gap, companies see their role as enabling communication in people's own languages and ensuring access to qualified interpreting when it is required.

4.3.1 Range of products and services

The market offers a broad spectrum of products and services:

- Telephone and video remote interpreting services that support both simultaneous and consecutive interpreting
- Remote simultaneous interpreting platforms
- Interpreter management systems
- Language service providers

- On-demand interpreting solutions
- Increasingly, AI-based services such as captions, speech translation, and machine interpreting

Interpreter sourcing is not typically conducted through direct hiring. Instead, companies tend to rely on external language service providers, freelance interpreters, applications submitted by prospective interpreters, interpreter registries, and internal vetting processes. Many companies conduct interviews, offer training, administer assessments, and carry out audits to ensure interpreters are qualified.

4.3.2 Use of AI

Respondents described three broad approaches to integrating AI:

- Adopt and configure LLM-based systems using speech and translation models from major technology providers
- In-house NLP models built to ensure control, mitigate privacy concerns, and avoid LLM-related problems (such as hallucinations)
- Hybrid systems, where multiple models run using different AI components simultaneously, depending on task demands (e.g. ASR + MT + correction)

Practical experiences and use cases

AI is already integrated into various stages of interpreting workflows (see Figure 6). For example, it can be used to generate summaries and transcripts, as well as corrected transcripts, using language models. AI also automates tasks such as interpreter booking and is being incorporated into call centre operations.

On-demand AI interpreting is generally considered acceptable for low-risk or informal situations, with human interpreters taking over if the AI system fails. However, for high-stakes encounters, AI is not preferred due to the risk of errors and threats to privacy.

Respondents emphasised that AI reduces costs and improves access to multilingual communication, making interpreting possible in settings where it was previously unaffordable.

Customer acceptance and adoption boundaries

The shortage of interpreters can sometimes push organisations to adopt AI solutions despite their limitations. Several respondents referred to various frameworks, such as the *Boostlingo framework* (discussed in section The AI Act and the need for risk analysis), to determine when AI should or should not be used. Feedback from customers on AI interpreting is mixed, with some companies reporting that clients have said they would end their contracts if the company replaced human interpreters with AI.

Data protection and security

Security and privacy are critical areas of focus. Market actors report that they collect and store interpreting data only if a customer explicitly requests it and provides consent. Any data collected for quality assurance purposes is stored for a limited period. Companies do not share customer data with third parties, nor do they use customer interactions to train their models. Services are hosted on secure, firewalled servers, many of which hold ISO security certifications and operate in full compliance with the GDPR. Although some participants noted that AI systems may provide stronger technical confidentiality than human interpreters, they agreed that highly confidential or sensitive situations are not suitable environments for AI interpreting.

Operational and market risks

Accuracy is consistently recognised as the most important quality requirement. While many clients are driven by price, organisations weigh cost savings against risks and note that public institutions should emphasise quality without compromising safety.

Using unqualified or unauthorised interpreters introduces safety risks, as they may rely on non-compliant or unregulated tools, such as Google Translate or ChatGPT, during assignments without detection, thereby compromising confidentiality. The entry of large technology companies into the market could transform the field by shifting interpreting from a language service to an IT-driven service, placing smaller firms under increased competitive pressure.

Informants also highlighted the limitations of AI, pointing out that it may struggle with processing speed and that it lacks cultural nuance and contextual understanding.

4.3.3 Implications for the interpreter profession

Respondents explained that, based on their experience, interpreters express uncertainty about their job security in the coming years. Some view AI as unreliable, while others already use machine translation and regard AI as a valuable tool.

The interviewees nonetheless believed that interpreters will remain necessary because language constantly evolves and AI ultimately learns from human linguistic input. However, the nature of the interpreter's role is expected to change. Interpreters may increasingly handle tasks such as system configuration, quality control, benchmarking AI engines, and guiding AI performance, acting as "language consultants." This shift will create a need for interpreters to receive education and training in areas such as computational linguistics, as well as how to work alongside AI. Human interpreters are likely to focus on high-stakes situations where judgment and specialised expertise are essential.

Interviewees expect future developments such as:

- Agentic AI
- Voice cloning
- Improved audio quality

The opinions expressed ranged from pragmatic to optimistic. The respondents emphasised that the risks lie not in the technology itself, but in the motivations and behaviours of the people deploying it. AI was described as enabling more flexible, scalable, and cost-effective interpreting in non-critical scenarios. Positive user experiences in low-risk contexts could lead to greater confidence in AI over time.

4.3.4 Key insights for market actor interviews

AI, particularly LLMs and NLP, is already embedded in interpreting services to some extent. However, there are concerns that large technology companies may enter the market aggressively, offering cheaper solutions that are presumed to be of lower quality and lack domain knowledge, thereby undercutting specialised interpreting companies.

According to the interviewees, highly trained interpreters will still be necessary, particularly in high-risk situations. At the same time, they stressed that training institutions should prepare interpreters to work alongside AI rather than fear it. This theme emerged repeatedly across the interviews, where the general view was that even if AI was to assume a portion of the market, experts will still be required to inform AI models. Secondly, if the interpreting market contracts, interpreters with skills in AI-supported workflows

(augmentation) will be far more likely to keep their jobs than those who lack the ability to use the new digital tools.

Overall, respondents noted that many customers already rely on free AI tools despite the well-known risks related to accuracy and data protection. While AI may help avoid the use of unqualified interpreters, it cannot replace professional interpreters.

The above sections present the views of market participants on current developments in interpreting. These include perspectives on technological risks, the future role of interpreters and ongoing technological change. These perspectives are inherently subjective, shaped by the experiences, interests, and positions of the interviewees. At the same time, several of these viewpoints align with the trends and risks identified in chapter 3, while others diverge or offer alternative interpretations. Taken together, these perspectives serve as signals of ongoing developments in the field. The presence of converging and diverging signals is consistent with the horizon-scanning approach outlined in chapter 2. This provides a broader basis for identifying emerging patterns and plausible future trajectories.

5 Professional perspectives on new technologies

Interpreters' attitudes towards technology differ sharply depending on whether tech is used to *support* or *replace* interpreting. Across the interpreting industry, AI technologies have evolved from assistive features embedded in computer-assisted interpreting (CAI) tools to autonomous systems capable of real-time speech-to-speech translation (often labelled "AI interpreting" or "machine interpreting"). In this chapter, we shift the unit of analysis from technologies and markets (chapter 3-4) to interpreting as professional work under technological change. This establishes criteria that will later be important for public sector considerations (chapters 6-7).

Research argues for interpreters to acquire critical AI literacy, emphasising that AI must remain assistive, transparent, and reversible. Also, a consistent body of studies on CAI + ASR tools (Defrancq & Fantinuoli, 2021) shows that interpreters can benefit from assistive tools and improve their performance. However, this body of research is almost exclusively focused on conference interpreting, leaving public sector interpreting, such as health and court interpreting, uncovered. Overall, the academic literature describes AI-enabled support tools as *productivity enhancers* that can, for example, reduce cognitive load, improve preparation, and enhance other activities, provided that interpreters retain control and accountability for the communicative act.

Traditionally, technologically induced changes to work are generally accepted when framed as assistive tools, but often strongly contested when framed as substitutes for professional judgement.

5.1 Augmentation and automation of professions

Technological innovation is increasingly woven into the fabric of the interpreting ecosystem, and its influence unfolds along two distinct trajectories: **augmentation** and **automation**. Automation focuses on replacing man with machine, and augmentation on improving man's ability to do the work. This is true for all sorts of technologies, but manifests differently depending on the technology and the context in which it is used.

Narrowing in on interpreting, the same distinct trajectories apply. Although both rely on the same underlying technologies, such as speech recognition, natural language processing, and machine translation, their purposes differ fundamentally. Augmentation refers to the use of digital tools to support interpreters in performing their core task of translating between languages. Automation, by contrast, designates the complete machine-based execution of the interpreting process itself. The distinction is therefore not technological but functional: the same ASR engine can either assist the interpreter in managing problem triggers or replace the human interpreter, as a component of a cascading interpreting system, by generating an entire speech-to-speech translation output.

The augmentation paradigm has been studied primarily in conference interpreting, where a growing body of experimental research shows measurable improvements in performance when interpreters use supportive tools. Real-time speech recognition, for example, can help ensure terminological accuracy, improve number rendering, and reduce cognitive load in complex passages (Defrancq & Fantinuoli, 2021; Li & Chmiel, 2024). This research has been accompanied by the emergence of commercial computer-assisted interpreting (CAI) solutions that integrate terminology management, automatic speech recognition, and context-sensitive prompts into interpreters' workflows. By contrast, public sector interpreting has seen far less exploration of augmentation. Dedicated software for healthcare, asylum, or community settings is still scarce, yet early studies suggest similar benefits: improved handling of specialised terminology, fewer omissions, and greater resilience in high-stakes interactions (Tan et al., 2025).

Automation, in turn, focuses on the complete technological execution of the interpreting process. While certain subtasks, such as terminology extraction or glossary generation, can be automated without replacing human interpreters, automation in the strict sense refers to real-time speech-to-speech or speech-to-text translation produced entirely by machines. This can take the form of turn-by-turn dialogic AI interpreting or continuous, simultaneous AI interpreting with short latency. In both cases, the system performs the interpreting task itself. Thus, even when they are built on the same technological foundations, augmentation and automation represent fundamentally different models of technological integration in interpreting: one supporting human agency, the other substituting it.

5.2 Technology in interpreting and its associated risks

It is essential to recognise that computer systems do not try to solve problems as humans do. They do not reproduce human cognitive processes or mimic human interpretative strategies; instead, they reach the same goals through entirely different methods. The history of flight illustrates this well: aviation was not achieved by perfecting Leonardo da Vinci's mechanical imitation of birds, but by discovering and applying the laws of aerodynamics. Similarly, AI systems support multilingual communication not by interpreting in a human way (this is, using contextual sensitivity, inference, world knowledge, and embodied interaction) but through statistical optimisation and pattern recognition. Even if human and machine outputs sometimes align, the underlying processes remain fundamentally different.

This distinction is important because it influences the ethical, practical, and legal implications of using automated systems. Can an AI entity be held responsible for its output? Can trust be equally placed in AI and human interpreters? Are there types of systematic errors unique to each? Evaluating automated interpreting solely based on accuracy or fluency overlooks critical aspects that affect the legitimacy of deploying such technologies.

Beyond these conceptual differences, other variables play an equally significant role when deciding whether full automation is appropriate. Availability and cost, for instance, clearly favour automation: machine interpreting can be deployed at any time, at scale, and at marginal cost. By contrast, quality in low-resource languages tends to favour humans due to the scarcity of training data and known limitations of current AI systems. Contextual risk is also important; errors in casual conversation carry different consequences from errors in healthcare or asylum settings, where misunderstandings can produce immediate harm. Thus, a risk-based approach becomes essential for identifying when machine interpreting is beneficial, when it is harmful, and when it is ethically required. To this end, we draw on a three-element risk framework adapted from Floridi's ethical approach (2023) and its application into interpreting by Fantinuoli (2025a):

Overuse occurs when machine interpreting is deployed without a genuine need, leading to unnecessary consumption of computational resources and higher environmental costs, given the energy-intensive nature of contemporary machine-learning infrastructures.

Misuse arises when the technology is employed in contexts where its limitations may cause harm, such as legal, medical, or otherwise sensitive domains, without adequate safeguards, cultural awareness, or contingency protocols. In such cases, misuse is not merely imprudent but unethical, as it exposes individuals to risks that they cannot assess or mitigate.

Finally, **underuse** refers to situations where machine interpreting is not adopted despite its potential to improve communication, accessibility, or inclusion. Underuse can be ethically problematic and economically inefficient, particularly when low-stakes contexts could benefit from automated multilingual

support. Reducing overuse, preventing misuse, and addressing underuse are therefore key to ensuring that automation evolves responsibly and in a manner that maximises social benefit.

In the context of machine interpreting for public service settings, the risks of misuse and underuse are particularly salient. In each case, deliberate measures and informed decisions are required to minimise potential harm and maximise the benefits of these technologies.

5.3 Automation as a transformation and not a replacement

Bainbridge (1983) wrote a seminal piece on problems inherent to manufacturing automation, entitled "The ironies of automation." The irony Bainbridge pointed out was the fact that a major driving force behind automation was the desire to remove the error-prone human operator, when automation in fact would create a setting in which errors would have even more serious consequences. Thus, automation makes humans' jobs more crucial and more difficult, rather than easier and less essential. Bainbridge's premise was that automation will always be partial: there will always be some tasks left for humans to do, or the automation process will create new tasks.

Finally, automation, of course, introduces new potential pain points and sources of error. Bainbridge also pointed out the irony that while one might want to save on training through automation (since no training is needed if people are removed from the workflow), those remaining will have a higher need for competence. Even worse, if the task humans are left with is to oversee the technology and intervene when something goes wrong, this may even increase the risk unless the human has received the necessary training.

Even if Bainbridge wrote about the automation of manufacturing, modern works on the automation of AI have already pointed out that AI-driven automation also gives rise to similar ironies. Endsley (2023) claims that Bainbridge's original thesis still holds, and that AI introduces *additional* ironies or risks, such as:

1. Artificial intelligence is still not that intelligent
2. The more intelligent and adaptive the AI, the less able people are to understand how the system works
3. The more capable the AI becomes, the weaker people's self-adaptive behaviours are for compensating for its shortcomings
4. The more intelligent the AI, the more opaque it becomes, and the less able people are to determine its limitations, biases, and appropriate uses
5. The more naturally the AI communicates, the less able people are to assess its trustworthiness

An illustration of these problems can be found in the so-called Dutch childcare benefits affair:

> When a family in the Netherlands sought to claim their government childcare allowance, they needed to file a claim with the Dutch tax authority. Those claims passed through the gauntlet of a self-learning algorithm, initially deployed in 2013. In the tax authority's workflow, the algorithm would first vet claims for signs of fraud, and humans would scrutinise those claims it flagged as high risk. In reality, the algorithm developed a pattern of falsely labelling claims as fraudulent, and harried civil servants rubber-stamped the fraud labels. So, for years, the tax authority baselessly ordered thousands of families to pay back their claims, pushing many into onerous debt and destroying lives in the process. (Rao, 2022).

This case exemplifies the dynamics described by Bainbridge and Endsley. Automation did not eliminate the need for human competence or judgement; instead, it shifted responsibility to oversight roles that required high expertise. This was undermined by limited transparency, time pressure, and organisational constraints. The opacity of the algorithm made it difficult for humans to understand its underlying logic, biases, and limitations, while its apparent authority reduced users' ability and willingness to critically

assess its outputs. Although the system was not based on contemporary generative AI or NLP, it still demonstrates how self-learning systems can amplify errors when human oversight becomes nominal rather than substantive.

For interpreting, these ironies suggest that automation will not simply "replace all interpreters" but instead transform the profession, redistributing expertise and responsibility. On the one hand, automated systems will be attractive for low-stakes, high-volume, or resource-poor environments due to their availability and low marginal cost. On the other hand, the very risks identified by Bainbridge and Endsley, such as opacity, bias, residual human oversight, and the amplification of errors, will likely lead to a re-evaluation of the indispensable role of human interpreters in high-stakes settings such as healthcare, asylum procedures, diplomacy, or law. New professional roles may emerge around monitoring, validating, and auditing AI-mediated communication, while institutions deploying automated interpreting will need not only trained interpreters but also informed decision-makers capable of risk assessment. In this sense, the future may bring not the disappearance of interpreting, but a more complex ecosystem in which automation coexists with, and even heightens the value of, human expertise, provided that the risks of overuse, misuse, and underuse are explicitly acknowledged and governed.

5.4 Professional organisations' perspectives, internationally

Industry data (e.g. Loch, 2025) reports 55 % of interpreters using at least one AI-based tool for terminology extraction, ASR captions, or glossary suggestions. Adoption still lags that of translators, in part due to workflow constraints and ethical reservations.

AI in Interpreting Use Case	% of interpreters
Look up terminology during interpreting delivery	19%
Extract named entities and key terms from reference materials	8%
Access real-time transcripts during interpreting delivery	6%
Obtain summaries from written, audio, and video reference / background materials	6%
Perform machine translation during interpreting delivery	6%
Access chat summaries during interpreting delivery	4%
Other	4%
Generate synthetic podcasts or audio recordings based on reference materials, to use as training or preparation tools	2%
Perform AI Q&A with reference materials and background materials during interpreting delivery	2%

53 linguists responded to this question, with the option to select one answer from a provided list and to indicate additional use cases under "Other". Of the two respondents that selected "Other", one cited "All of the above", and one cited "Research for the assignment topic when reference and background materials are not provided".

Table: Slator • Source: Slator

Figure 4 *AI in interpreting use case* (Loch, 2025)

In contrast to the cautious positive view on supportive tools (i.e. augmentation), interpreters and their associations express much more scepticism and ethical concern towards fully automated interpreting (i.e. automation).

The European Legal Interpreters and Translators Association (EULITA), in written evidence submitted to the UK House of Lords Public Services Committee's inquiry into Interpreting and Translation Services in the Courts, highlights unresolved issues of liability, confidentiality, and accuracy in legal settings (*EULITA –*

Written Evidence (ITS0053), 2025). Their answer to the question "would adoption of this technology in the courts be an appropriate use?" was as follows: "No, for the time being, it would not be an appropriate use. The main reasons are that the output of human translators and interpreters is more accurate than the output of the MT or AI." The answer further goes on to highlight the lack of clear answers regarding (legal) liability for mistakes and their consequences, and how such tools fare in terms of GDPR and risks in terms of privacy and confidentiality.

The Globalisation and Localisation Association (GALA) has held workshops for industry leaders on automated interpreting. Members see AI interpreting as a way to expand multilingual access, reduce costs, and support interpreters with better training, while enabling remote and automated services. They also recognise challenges related to reliability, ethics, cultural bias, and the suitability for marginal languages and sensitive areas. GALA views AI interpreting not as a replacement, but as a force that will reshape the ecosystem, improving availability, creating new opportunities, and posing risks to quality, regulation, and livelihoods.

Findings from CSA Research (2024), an independent US-based market research company in "global content and language services markets," illustrate this ambivalence: trust in automated interpreting remains extremely low, with only 10% of respondents expressing full confidence in AI systems. According to the study, this is partly due to limited exposure to AI tools; just 11% of interpreters report moderate or extensive experience with automated interpreting, and those without experience tend to underestimate actual capabilities based on belief rather than evidence. According to CSA's research, accuracy is the single most important criterion for determining whether AI can be used, with 34% of interpreters believing AI is already, or soon will be, adequate for simple exchanges, and only 9% considering it suitable for complex interactions. Practitioners in this study consistently favour augmentation over replacement. They emphasise that AI systems struggle with context, tone, emotion, cultural meaning, humour, sarcasm, dialectal variation, irregular grammar, and imperfect or distressed speech. Limitations become especially visible in sensitive scenarios such as emotional crises, psychosis, or communication involving speech impediments. In their conclusion, AI offers benefits in terms of accessibility, availability, and cost, but misleading claims about language coverage and error frequency undermine the perceived value of these gains. Their analysis found that ethical concerns remain prominent, alongside strong calls for clear guidelines, accurate testing, and greater transparency around system performance.

Recent work by the European Language Council (2025) highlights an increasing unease among translators and interpreters about the rapid and largely uncritical adoption of generative AI in multilingual communication. While professionals recognise potential productivity benefits, a clear majority report low usage of GenAI tools and express concerns about declining output quality, confidentiality risks, and heightened cognitive load when post-editing machine-generated text. Notably, the report warns that LLMs simulate communication rather than comprehend it, producing outputs shaped by probabilistic prediction, uneven linguistic data coverage, and embedded human biases. These limitations, along with pressures on rates and job security, foster a powerful sense of professional and existential insecurity within the interpreting community. This emphasises the need for realistic expectations, careful risk assessment, and sustained investment in human expertise in sensitive public-sector contexts.

In the following table, we summarise statements from various professional bodies on technology, with references to relevant position papers or statements that take a position on the use of technology (and AI) for interpreting.

Table 3 Positions of international interpreters' bodies on technology

Professional body	Position
International Association of Conference Interpreters (AIIC) (2025)	Through guest writers on their pages, AIIC recognises AI's potential to support preparation, note-taking, and quality monitoring, but stresses that "human understanding remains central." AIIC also highlights that clients often assume interpreters are already using AI and stresses the need for interpreter education and for human-centric reflection. AIIC has published a checklist for evaluating the use of AI (see section 3.6).
International Federation of Translators (FIT) (2024)	In its *Position Paper on the Use of AI in Interpreting* (2024), FIT encourages experimentation with AI tools under human control. The association, representing over 65,000 practitioners, is "firmly against the replacement of human interpreters with unsupervised, unrevised machine interpreting." This position is given regarding the case of a proposed Czech bill on the use of a "certified technical device […] instead of an official interpreter." FIT's conclusion is that this does not guarantee the rights set out in the European Charter of Human Rights (and Czech law), and that "AI-powered translation is currently an unreliable technology and is not sufficiently mature to adequately replace human translators and interpreters in sensitive legal situations, especially regarding immigration law. Artificial Intelligence cannot be used in an unsupervised form and requires professional human oversight both now and for the foreseeable future."
Chartered Institute of Linguists (CIOL) (2025)	CIOL's White paper (2025) emphasises that "we need to view AI as a toolkit […]; only the linguist can use their deep understanding of the context, culture and customer requirements to make the final decisions," indirectly stressing the idea of AI tools as a welcomed opportunity to enhance some aspects of the work, but only if used by professional linguists. "Efforts should therefore be made to advance the safe development of high-quality machine translation/interpreting."
Société française des traducteurs (SFT) (2024 & 2025)	SFT's statement on AI (2025) emphasises transparency and human-expert control in using AI. The association's survey-based reports (2024) show that "AI and automation" are now the leading professional concern among interpreters, with worries centred on deskilling, market erosion and declining trust in interpreting services.
British Interpreting & Translating Institute (ITI) (2024)	Policy statement on AI (Davies, 2024) quoted *verbatim*: • The human is, and will continue to be, essential to ensuring high-quality, accurate and ethical translation and interpreting outcomes. • The evolution and regulation of generative AI technologies are out of our control, but we might need to selectively challenge some developments. • New models of working could offer the potential for new commercial opportunities and diversification. • Much more content will (need to) be translated in the future.

	• The most skilled linguists will be in greatest demand; i.e. commercial success will lie in specialisation rather than generalisation.
Norwegian Association of Interpreters (Norsk Tolkeforening, NTF) (2025)	In an interview with the Norwegian Association of Interpreters conducted in the autumn of 2025 in connection with this research project, their representatives stated that the association does not hold a formal, official position on the use of technology in interpreting. However, NTF is affiliated with the International Federation of Translators (FIT), and it was stated that NTF supported FIT's view on technology. The association further emphasised that practices vary among interpreters, with some using digital support tools and others not. Their primary concern is that interpreting services remain secure and of high quality; technologies that can be shown to contribute to these objectives may therefore be viewed positively, provided that they function as assistive tools rather than substitutes for professional interpreters.

Overall, machine interpreting is widely viewed as a functional accessibility layer, but not a viable substitute for professional interpreters in contexts involving responsibility, nuance, or risk. The prevailing stance among practitioners combines cautious curiosity with a clear reaffirmation of professional boundaries.

The available evidence remains too limited to allow a comprehensive, empirically robust assessment of European (including Norwegian) interpreters' attitudes towards the transformations introduced by AI, both as a supportive technology (augmentation) and as a potential replacement for human professionals (automation).

Notwithstanding this, several recurring patterns and shared positions can be identified across surveys, association statements and analyses:

- **Pragmatic openness to assistive AI**. Most interpreters accept the introduction of AI tools that demonstrably enhance preparation, terminology management, note-taking, or accessibility. These technologies are perceived as extensions of the interpreter's abilities, not as competitors.
- **Strong resistance to automation**. There is a widespread scepticism towards fully automated or "AI interpreting" systems. Interpreters and associations consistently emphasise that machine-based outputs lack contextual understanding, ethical accountability, and the human responsiveness required in real communicative encounters.
- **Ethical and governance concerns**. Professional bodies underline unresolved issues surrounding data protection, confidentiality, bias, and liability. There is a growing call for *clear professional standards* and *regulatory frameworks* governing the use of AI in multilingual communication, particularly in high-risk settings such as legal and medical interpreting.
- **Need for critical AI literacy**. Both practitioners and educators recognise that futureproofing the profession requires training in understanding, evaluating, and integrating AI responsibly, bridging the gap between technological competence and market demands.

In sum, attitudes towards AI remain dual but coherent. This nuanced position may reflect a profession seeking to adapt to technological change without surrendering its human and ethical foundations. This is also in contrast to the market actors in chapter 4, who emphasise scalability, access, and feasibility. The inside-out focus of professional interpreters emphasises responsibility, quality, and risk.

These nuances are important in understanding how technology can and should be handled in the Norwegian public sector; the responsible introduction of technology is conditioned by a beneficial alignment of available technology and interpreter uptake.

6 Public sector interpreting in Norway

From an international perspective, Norway enjoys a relatively privileged position in public sector interpreting. It is one of the few countries in the world where interpreting for minority-language users is firmly secured in society, largely due to its legal anchoring the Interpreting Act, which came into force in January 2022. As mentioned in section 1.1, the Interpreting Act states that public bodies are required to use an interpreter when this follows from specific legislation, or when it is necessary to uphold legal safeguards or ensure proper assistance and services. While the Interpreting Act itself is relatively new, the legal text is a formal and legal grounding for already existing practices.

Norway has developed a stable system for the training and accreditation of interpreters working in the public sector, articulated around the National Registry of Interpreters, which is managed by the Directorate of Diversity and Integration (IMDi). This registry is older than the Interpreting Act: it was established in 2005, reflecting a long-standing practice of regulating the use of interpreters in the public sector.

The registry classifies interpreters with official qualifications into five categories from A to E, where A represents the most qualified interpreters (see Figure 5).

In Norway, most interpreting assignments are conducted by a qualified interpreter (68% in 2024, according to the report Tolkemonitor LOV, 2025). However, many languages suffer from sparsity of interpreters in the top (most qualified) categories.

IMDi monitors the use of interpreters in the public sector. Since 2020, the consultancy firm Oslo Economics has conducted regular analyses of interpreter use for IMDi. According to their report Tolkemonitor SPRÅK 2024 (2025), an estimated 1.34 million interpreting assignments took place in 2024, representing a 7% increase in spoken-language assignments compared with 2023. While overall demand continues to grow, several interpreting service providers report a slight recent decline in activity.

Remote interpreting dominates the market: telephone interpreting accounts for 72% of assignments, followed by on-site interpreting (26%), and video remote interpreting (2%). This share has remained stable despite policy emphasis on video solutions.

Regional health authorities account for the largest share of assignments (44%), followed by municipal services (41%), primarily within health and care, social services, integration, child welfare, and education. The remaining demand is distributed across state agencies, including the justice sector.

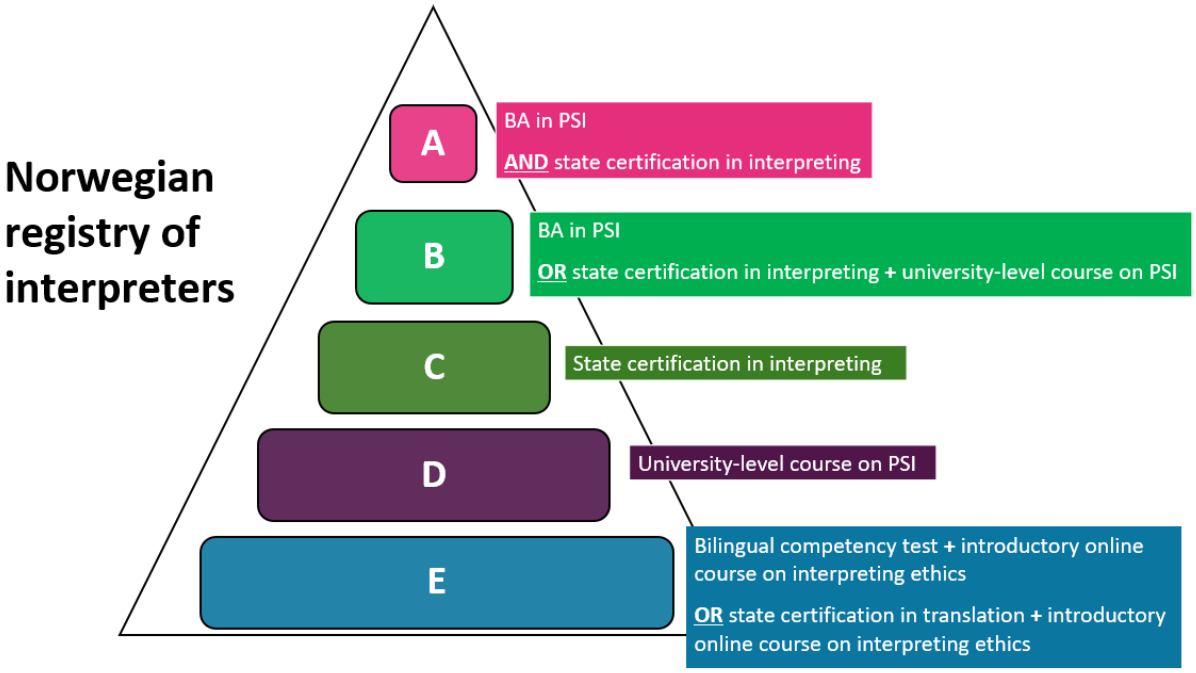

Figure 5 Types of interpreters in the Norwegian National Registry of Interpreters

6.1 Interpreter assignment and digital support tools

More than a million interpreting assignments have been handled annually in Norway since 2023. Naturally, a set of underlying processes is required to make this possible. To understand how public sector interpreting can be supported by digital technology, it is important to look at the workflow for interpreting assignments and see which digital technologies support (or are intended to support) the various parts of the workflow. The following high-level process diagram was created to illustrate the main stages of interpreting assignments and their supporting digital technology. The term high-level is used here to denote that not all steps are conducted in the same order by all actors; the process description does not identify which actor takes which steps. In the same way, the technologies identified as supporting the process are not in use in all the assignments; some technologies may be known but not used.

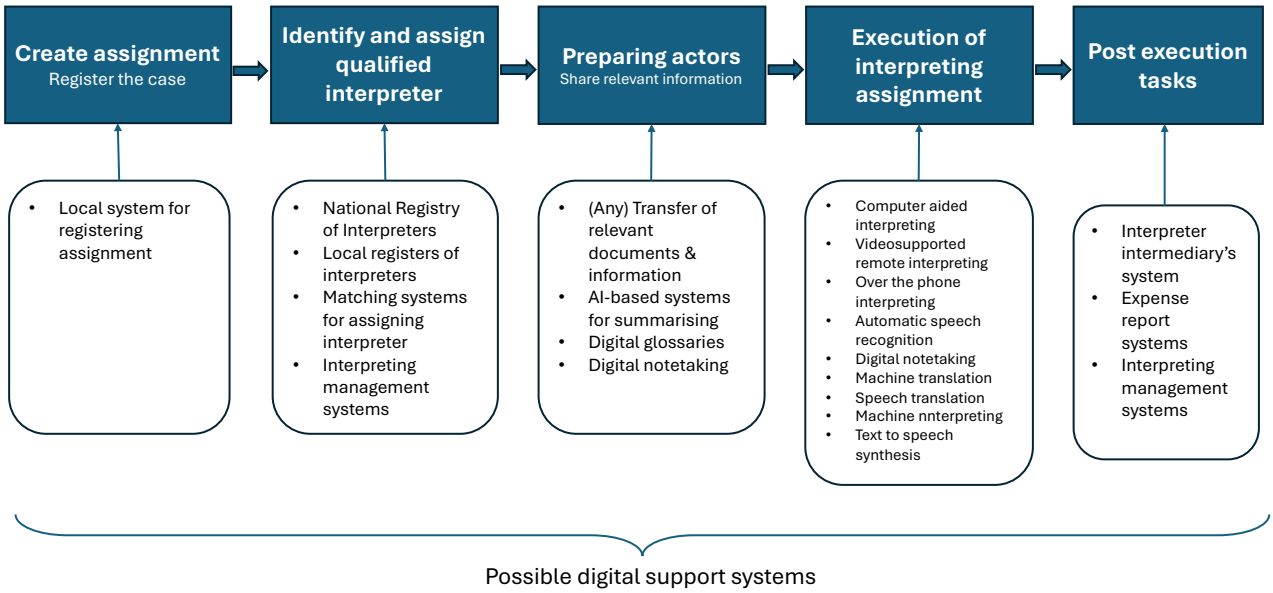

Figure 6 High-level workflow of interpreter assignments and supporting technology. Created during the first workshop.

The following steps in the process were identified: creation of the assignment and case registration, identification and acceptance of the interpreter for the assignment, preparation for interpreting, performance of interpreting, and post-assignment tasks. The tasks and the technology supporting them are as follows:

1. **Creation of assignment**. A public body plans a meeting/encounter with a minority-speaking individual and decides that an interpreter is needed. The relevant public body also registers a case.
2. **Identification and assignment of a qualified interpreter**. This can be done by the public body itself or with the support of an interpreting agency. In both cases, there is a need to match the assignment's needs with a suitable interpreter. Note that the first contacted interpreter may reject the assignment, in which case the process is repeated until another interpreter accepts.
3. **Preparation** covers activities from the moment an interpreter accepts the assignment until the performance of the interpreting. In this phase, the interpreter prepares for the assignment and seeks to learn as much as possible about its context. This often includes asking questions to the public body assigning the case, creating glossaries for the assignment, and other activities meant to support the interpreter's work during the assignment. The public body representative(s) will also prepare for the meeting; providing information to the interpreter is one form of preparation that should always be a part of the process.
4. **Performance of interpreting** is the real-time act of interpreting between the minority speaking party and the public body. This is the core of the interpreter's work, and it can be done remotely or physically. Currently, telephone interpreting accounts for more than 70% of assignments. The performance phase is where interpreters are susceptible of being replaced by various translation tools; the whole public sector interpreting chain would then collapse.
5. Finally, in the **post-assignment** phase, the interpreter confirms that the work has been completed, submits fee and expense claims, and may provide feedback on the assignment if appropriate. The other actors can also provide feedback on the interpreter and his/her work.

6.2 Technologies supporting the workflow

The workshops identified the following supporting technologies for each of the steps mentioned in the previous section:

1. **Creation of assignment**. This phase is carried out by the relevant public bodies, and the decision itself is made manually. We are not aware of any specific supporting technology. Each public body registers assignments in their own internal system. This phase was not deemed relevant in the discussion on technologies.
2. **Identification and assignment of a qualified interpreter**. Several digital technologies support this stage. The National Registry of Interpreters provides an overview of interpreters and their qualifications and can be used to identify suitable candidates. Many interpreting agencies and some public bodies maintain their own internal registries. Systems also exist that identify and contact interpreters to check their interest and availability. In addition, various "interpreter management systems" automate and coordinate the administrative aspects of interpreting assignments, including scheduling, booking and managing interpreters, and handling billing. Their functionalities vary considerably, and no single standard solution is used across all organisations.
3. **Preparation**. This task can be supported by any technology able to deliver information about the upcoming assignment; an email with an attachment might be sufficient. In addition, the interpreter might use various systems for creating glossaries with specific terms for the type of assignment, test different solutions for notetaking, etc. Depending on their capabilities, it should be possible to use interpreter management systems to support assignment preparation and information sharing. However, this was not mentioned in the discussions.
4. **Performance of interpreting**. The use of technology in this phase ranges from various remote technologies like phone, video, and remote simultaneous interpreting, to the various translation and interpreting systems based on AI (machine interpreting, automatic speech recognition, etc.).
5. **Post-assignment** systems are few, but interpreters typically confirm completion of the assignment and bill their work. Interpreting agencies have systems in place for reporting and possibly also registering the quality of the interpreters' work.

The list of technologies possibly supporting the workflow shows that public sector interpreting is already digitalised to a quite large extent. Broadly speaking, there are three different types of digital technologies in use:

1. **Administrative and management tools that structure the assignments and facilitate preparation and post-assignment work**. This category includes interpreter registries, matching systems, interpreter management systems, information transfer systems, expense reporting, digital glossaries, etc. In short, all technologies supporting the assignment but not related to the performance phase. These tools are meant to augment the process.
2. **Systems allowing remote interpreting**. These systems are well-known and frequently used, especially in telephone interpreting. Video-based systems are not yet much in use, but we may expect them to increase. These systems assist everyone by making interpreting more independent from geography, and almost equally available across the country. Such technologies are also meant to augment the process.
3. **Systems that perform some sort of automatic translation**. These systems can be used in two ways: as tools that augment interpreters, or as technologies that automate interpreting by

replacing human interpreters altogether. Such systems are well-known but, to the best of our knowledge, not popular among interpreters.

We do not have any hard numbers on the actual use of these technologies in Norway, except for telephone interpreting, which was used in 72% of assignments in 2024.

Regarding these technologies and their use, the following idiosyncrasies of public sector interpreting in Norway should be remarked:

- Most interpreters are independent actors, and there are several private (and some public) intermediaries.
- Intermediaries are independent actors with agency to decide whether to use any technology.
- The public bodies creating the assignments are independent from each other and have their own technological systems and internal requirements for technology use.

This is an ecosystem of relatively independent actors, each making decisions on which technologies to use. In this landscape, it is difficult to introduce or prevent the use of any single technology that the actors may desire. Technology usage will mostly develop to the extent to which the actors find it useful. As actors interact and depend on each other, they can influence and shape each other's decisions, but this is a long and complex process. The still marginal use of video remote interpreting in the public sector despite IMDi's attempts to promote its use is a good example of this.

6.3 Public sector communication with language barriers

The purpose of the Interpreting Act is to ensure that minority speakers can access proper assistance in their encounters with the public sector. In this report, we use the term "public sector communication with language barriers" to refer to the overall issue of communication between minority speakers and public sector representatives.

However, interpreters are not always involved in all interactions between a public body and a minority language speaker where there is a language barrier. There are several reasons for this: time constraints, lack of interpreter availability, and other practical challenges are among the most important.

Over time, a minority speaking person may encounter meetings with and without an interpreter in the same process chain. Let us, for instance, take a prolonged hospital stay. In such cases, few institutions can afford to have an interpreter available for the patient during the whole hospital stay, so there will logically be situations where interpreter-supported communication is simply not an option. In such instances, communication is limited to whatever the actors manage to convey via gestures, familiar words, friends or relatives of the minority speaker, or other aids such as standard phrase lists or tools like Google Translate. When there is a need, health personnel use whatever

While claims that "there are not enough interpreters to meet the demand" are often made in absolute terms, the Tolkemonitor reports provide a more nuanced assessment based on capacity, qualification levels, and language coverage. The analyses show that even with high use of existing interpreters, there is a substantial need to qualify more interpreters at levels A–D, while capacity at level E is more balanced.

According to Tolkemonitor språk 2024, an additional 1,618 qualified interpreters across 63 languages are needed, which indicates a persistent shortage of qualified interpreters in Norway.

tools are available,[16] even if they know it is not ideal. Some of these practices breach the Interpreting Act and are not seen as optimal, yet they are a reality.

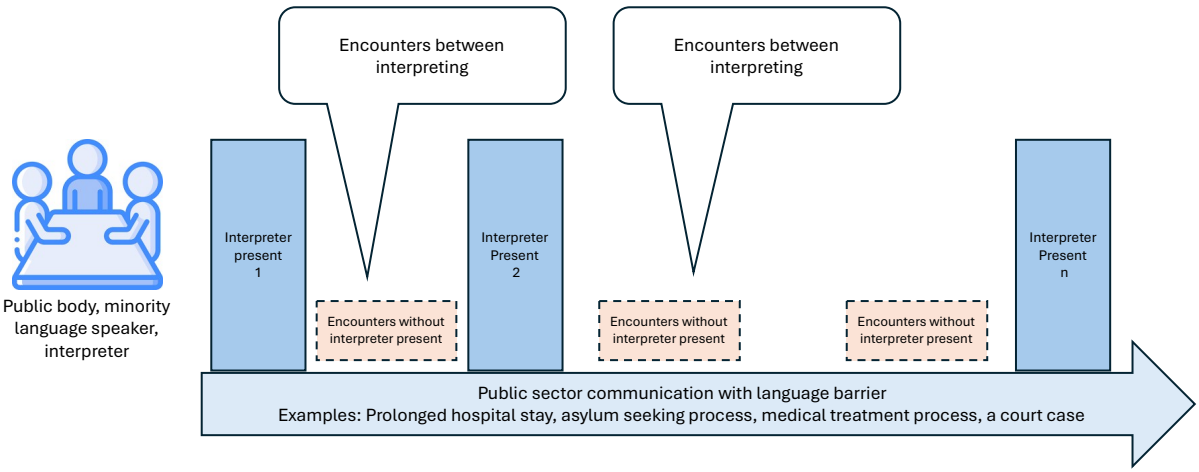

Figure 7 Public sector communication with language barriers, alternating between interpreter present and not present

As mentioned, many public sector encounters take place without interpreters. Even though no exact figures on this phenomenon are available, we do know that these situations are frequent and problematic enough for the police and the health sector to warrant various projects where the use of automated translation is investigated (see section 6.4). After all, encounters where the parties cannot communicate adequately may not only potentially breach the Interpreting Act but also carry the risk of a whole series of unfortunate consequences. Some of them could be quite severe, like inadequate healthcare provision or wrongdoing in judicial procedures.

The lack of an interpreter may, however, not necessarily be a problem in some situations. The Interpreting Act §6 requires the need for interpreting to be assessed. There may be encounters between minority speakers and public service providers where the assessment concludes that there is no need for an interpreter. Consequently, we have identified four different possible types of settings in public sector communication with language barriers based on the presence or absence of an interpreter, in combination with the presence or absence of a need for interpreting.

The four settings can be summarised as follows:

[16] See (in Norwegian) https://www.helse-sorost.no/siteassets/documents/helsefaglig/digitalisering-og-e-helse/foranalyse-kommunikasjonsverktoy-samlet-versjon.pdf.

Table 4 Four different settings in public sector communication with language barriers

	Interpreting needed	Interpreting not needed
Interpreter present	Interpreter present + need for interpreting = situation is compliant with the Interpreting Act (1)	Interpreter present + no need for interpreting = situation is compliant with the Interpreting Act, but interpreter is overused (2)
Interpreter not present	Interpreter not present + need for interpreting = situation breaches the Interpreting Act (3)	Interpreter not present + no need for interpreting = situation is compliant with the Interpreting Act (4)

So far, there is nothing new in the discussion; this is what the situation was like before the various technological tools that can potentially disrupt the market were created. The issue here lies in the assessment of the need for interpreting in each individual public sector encounter with a minority speaker. This is not always a straightforward process, and there is grey zone here where someone needs to decide based on their own judgement whether the parties require interpreting. Public bodies have extensive experience in this, and they can be expected to base their decisions on that experience. As the focus of this report is on the role of technology, the question is whether, and if so when and how, it is appropriate to use interpreting technology in the various settings. This question was explored in section 5.4, where several guidelines for the use of machine interpreting were mentioned. Let us now discuss the role of machine interpreting in the four different settings.

Setting 1: An interpreter is needed and present

If machine interpreting augments the interpreter, this will simply increase the quality of interpreting. There is a risk of cognitive overload and potential conflicts between machine interpreting and human interpreting, but if the interpreter is present and in control this should be manageable. In such scenarios, interpreters use technology as they see fit.

Setting 2: An interpreter is not needed, but present

This situation causes an overuse of available interpreters. Adding machine interpreting to this setting will have no positive effects.

Setting 3: **An interpreter is needed, but not present**

Adding machine interpreting to such a setting may have several consequences. The interpreter is substituted by technology. All risks from automation and AI are present, and there is no human oversight on the technology. This is a clear window of opportunity for inappropriate use of machine interpreting. However, this setting also has some positive risks, i.e. possible gains. The most important of these is simply that the technology may solve the need for interpreting. This is of course dependent on the on the quality of machine interpreting as well as the context in which the interpreting takes place. If the actors interacting in this setting, namely the public sector representative and the minority speaker, feel that the communication barriers can be overcome by the technology, then the technology will be used.

Setting 4: **An interpreter is neither needed nor present**

There is no need for either machine or human interpreting. The question in this case is how this situation can arise. If the reason is that the minority speaker has sufficient command of Norwegian to communicate, or that the situation is so simple that non-verbal communication or pre-translated instructions are sufficient, then everything may be fine. However, it is possible that such a situation is created by machine

interpreting. If one of the participants uses a machine interpreting solution on their phone, for example, and the result is deemed good enough by both parties, then there is a chance that the participants will continue to rely on machine translation. Thus, the use of technology can create a dependence on the technology and an unregulated practice (habit) of using it. It may also cause parties to overly trust the technology, which can lead to it being used in situations where it should not be. This is "AI seeping into interpreting," as the Nimdzi 2025 report put it (see section 4.1). Thus, the grey zone between needing and not needing an interpreter may expand, causing a rise in the number of settings where an interpreter is not present, which in turn would increase the chances of technology misuse. After all, there are policies in place against the risky practice of bringing "your own human translation support," such as a spouse, a friend, or children (the latter constituting a legal offence), but there are no rules against using machine interpreting in your own personal device.

To summarise the role of machine interpreting in the various settings:

Table 5 Different settings and the role of machine interpreting

	Interpreting needed	**Interpreting not needed**
Interpreter present	Compliant with the Interpreting Act. Machine interpreting can be used as an augmentation tool (1)	Overuse of interpreter resources. Machine interpreting does not add anything (2)
Interpreter not present	Window of opportunity for inappropriate use of machine interpreting, where technology replaces the interpreter. High-risk setting, but also, a setting where technology might solve the problem of interpreters being needed but absent (3)	Machine interpreting may be the reason why there is no need for interpreters. In appropriate settings this could be fine, the problem is identifying which settings are appropriate. And even then, it risks establishing a common and unregulated practice, trust, and reliance on using machine interpreting (4)

Machine interpreting creates both challenges and opportunities. The settings where an interpreter is present are the least problematic. Machine interpreting can augment the interpreter, and even if there is a risk of overusing available interpreters, humans are still in control. In setting 3, where an interpreter is needed but absent, there is a window of opportunity for technology misuse. Here, machine interpreting may end up wrongly substituting the interpreter. Setting 4 is also potentially challenging. At first glance, the use of machine interpreting where no interpreter is needed or present, may just seem superfluous. However, there are two important issues here. The first is whether an interpreter is not really needed in the encounter. The existing framework and guidelines for use of machine interpreting (see section 3.6) show that this is not always a straightforward assessment. It is also important to remember that a meeting that is initially considered low risk may evolve into a higher risk situation. This would change the nature of the encounter from a type-four setting to a type-three setting. Secondly, there is the key issue of whether the parties really understand what they are doing when using machine interpreting in such encounters. It might seem harmless to bring your own translation device or app to the meeting. It might even be an integral part of your mobile phone, in which case it will be in the room with you anyway. This is where and how unregulated practice and over-reliance on technology can occur.

Endsley warned about these risks (see section 5.3). When we do not understand the AI system, we can make wrong judgements about its output. Knowing technology also makes us able to choose the appropriate technology for each task. Some risks may be eliminated or greatly reduced by choosing one technology over another. For example, privacy risks can be greatly reduced if a particular interpreting technology operates locally rather than in the cloud. Knowing the difference has a great impact on decision making.

Finally, the need for updated competence when conducting risk-based assessments of interpreting needs must be underlined. Decision-makers should know the strengths, problems, and risks of the technology being considered, in this case machine interpreting. There is a need to assess the technological quality of the machine interpreting in use at any given time.

6.4 Norwegian studies on AI for interpreting and translation technologies

This section reviews Norwegian research and development projects testing emerging interpreting and translation technologies. The purpose is to understand the types of experimentation that have taken place, their technological focus, actors involved, and what lessons these experiments provide for future technology adoption.

The development of translation and interpreting technologies has not been overlooked in Norway, although here we have limited our scope to public sector interpreting and translation. As discussed in section 6.3, there are several pain points in these types of encounters, and the aim of improving quality and reducing costs through new technology is always present. This situation has led to several experiments conducted by different actors to improve all aspects of public sector interpreting described in section 3.

The list below is based on the expertise of the researchers and IMDi and is not meant to be an exhaustive account of all experiments conducted in this field in Norway.

6.4.1 Studies

AI4Interviews (2022-2025)

AI4Interviews was an innovation project within the Norwegian police that explored how artificial intelligence could make police work more efficient. It is a collaboration between the police, NTNU CCIS, and industry partner Schjønhaug AS. The project focused on solutions in areas such as interviews, investigations, crime scene examination, reporting, court transcription, and crisis exercises. It was funded by the Research Council of Norway. It won several awards:

- The Digitalisation Award 2025 (Norway)
- Europol's Excellence Awards in Innovation (Europe)
- The Global Innovation Management Institute Awards (Global)

The focus of the project was not on translation or interpreting, but on documenting interviews in the field (which would normally take place without an interpreter) and reducing the workload involved in transcribing the interviews after they were conducted. An important aim of the project was to develop automatic *transcripts* of interviews, not automatic *translation* or *interpreting* between the participants. However, some of the key technologies explored in the project included speech-to-text and the quality of speech-to-text. This demonstrated that speech-to-text technologies are of interest to the police, also in field settings. A possible future use of these technologies could then be to provide automatically translated transcriptions of spoken discourse into Norwegian, moving from automatic translation and transcriptions

to automatic interpreting. So far proofs of concepts have been developed, but there is no indication that the results have led to large-scale use outside the project.

Sunnaas sykehus – privacy-protected real-time translation (2023-2025)

Sunnaas Rehabilitation Hospital (Sunnaas sykehus) is Norway's largest specialised hospital for physical medicine and rehabilitation. The hospital provides multidisciplinary rehabilitation for patients with complex functional impairments following illness or injury, including spinal cord injuries, traumatic brain injuries, stroke, severe burns, neurological disorders, and rare congenital conditions. It serves both regional and national roles and treats around 7,500 patients annually (in- and outpatients). Sunnaas has since 2023 collaborated with technology provider Mabel AI on an app for real-time translation in the healthcare sector. The solution is specially designed to meet the needs of clinical communication and offers instant, secure translation of medical conversations without sharing any data with third parties. It is primarily intended for simple, daily communication and will not currently replace the need for a professional interpreter in various situations. The app functions both as a transcription and translation tool, with data being processed either within the organisation (on-premise) or locally on the device (on-device). Together, Mabel and Sunnaas have customised the solution to meet local security requirements. Testing has been ongoing since the end of 2024 and has so far involved the departments of multi-trauma, neurology, burn injuries, and the children's unit at Sunnaas. According to the hospital, the use of interpreters has not decreased since the project was introduced. Therefore, this is an experiment to address the challenges when no interpreter is available. The project has not produced a final report at the time this document was drafted, but the users report promising results in the initial phase.[17]

OVERSETT: Kvalitet i KI-oversettelse av skriftlig informasjon til småbarnsforeldre som ikke er norskspråklige (2025-2026)

The aim of the "Oversett" (Translate) project is to evaluate differences in quality and accuracy between AI-generated and human translations of written health information from Norwegian health centres to parents. This will be achieved by comparing two language models (Google Translate and ChatGPT plus) and professional human translations of a total of five high- and low-resource languages commonly used by immigrant groups in Norway. The project has received funding from Fysiofondet, with results set to be published in 2026. The project is led by the Norwegian Institute of Public Health (NIPH).

The aim of the study is to increase awareness among clinicians, decision-makers, and healthcare students about the importance of creating written health information, guidance, and educational materials that are accessible to all recipients of healthcare services, regardless of language proficiency, thereby helping reduce health disparities. The study is conducted in collaboration with researchers at OsloMet across the disciplines of health sciences, technology, and translation studies. No results are available at present, since this is an ongoing study.

Tverrspråklig effektiv kommunikasjon (TEK) (2024-2025)

In Tverrspråklig effektiv kommunikasjon (Cross-lingual Effective Communication), the Norwegian police managed numerous encounters where there was no access to interpreters (supported by StimuLab). The goal was to use LLMs to assist initial meetings between police and minority speakers in encounters that usually/currently take place without interpreters, automating translation where no interpreter is available.

[17] https://www.sunnaas.no/om-oss/nyheter/banebrytende-oversettelsesteknologi-testes-pa-sunnaas/.

The project was not intended to produce fully developed solutions, but to gain understanding and insights for future work. The TEK project provided valuable insights through interviews, citizen panels, workshops, and technology testing in sandboxes. This showed how residents without Norwegian or English skills face uncertainty, shame, and loss of control, while officers experience stress, extra work, and risk of errors. Insight into the situation was gained, but no solutions were found. Following TEK, an application was made to the Norwegian Research Council to continue this work.

Can interpreters be substituted by digital translation? (2019)

The pilot project "Kan tolker erstattes med digital oversettelse?" (Can translators be substituted by digital translation?), led by OsloMet in collaboration with UDI, was conducted in 2019 to test the use of Google API translation during immigrants' first encounter with the police in six languages (Arabic, Somali, Pashto, Farsi, Turkish and Russian).

The pilot indicated that the results were not satisfactory in terms of the quality of the technology, data protection, and related issues. Therefore, it was recommended to delay the project's implementation until the technology improved and to develop a course for interpreter users in AI-assisted communication. Given the rapid development in machine interpreting since 2019, this project's conclusions may now be outdated.

6.4.2 Cross-cutting insights

The first cross-cutting insight from this list is that research seems to be focusing on communication settings without interpreters. No projects have been identified on how interpreters could use technology to augment interpreting, and there are no projects on risk identification and assessment either. Interpreters are absent from all but one of these studies (the last one on the list, from 2019, whose results may no longer be relevant).

Secondly, there is a growing interest in understanding speech-to-text and real-time translation technologies. Among the frequent users of public sector interpreting, perhaps most notably the police and health sectors, there is a consistent interest in the following issues:

- Speech-to-text is piloted in many contexts and organisations
- Speech-to-text technology seems to be most mature for documentation, with feasibility and explorative work towards communication support
- Solutions usable in the field and/or frontline services seem to be the ultimate goal

Projects tend to focus on encounters without a qualified interpreter, but do not necessarily seek to replace the interpreter. As such, technology seems to be more of a "gap-filler" for daily, low-stakes communication, and of less interest for formal meetings, legal proceedings, or presumed critical clinical decision-making.

Thirdly, the gap between individual studies with positive results and actual changes in everyday work practice is still large. The studies provide information, show proof of concepts, and help identify opportunities, but implementing these technologies in large-scale settings is an entirely different issue. This is common with technological development; it takes time and effort to transform an idea into large scale work practices.

7 Emerging technology in interpreting: future scenarios

The reason a chapter on future scenarios is included in this report is that the effects of technological change are not deterministic. How, when, why, by whom, and at what speed a technology is adopted and what its consequences are depends on decisions made by people and organisations. There is therefore a need to think systematically about which decisions can be made, by whom, and what effects they may have, among other considerations. The scenarios presented here are simply a way to structure the reflection process.

Horizon scanning glossary

Driver: "A driver references the underlying cause of change. These may or may not be directly related to the issue at hand."

Trend: "A directional assessment of something that is changing or developing over time. Often it is a result of specific drivers."

Weak Signal: "These are generally understood as current or past developments with unclear implications to future developments."

From McCrickard and Rajic (2014)

7.1 On the speed of technology uptake

Technological development in the field of language technologies is currently advancing at a rapid pace, and it may appear as though decisive change is already underway. To some extent, this perception is justified. Significant technological breakthroughs have already occurred, and further advances are likely. These developments will affect interpreting. However, neither the form nor the timing of these changes is predetermined. There are several reasons to expect a more gradual transformation rather than an immediate disruption.

The first reason is that all technological developments and breakthroughs take some time to be widely adopted. Technology uptake and adoption happen after the development phase, when someone decides to use the technology. Some technologies are taken up quite fast. This was the case of smartphones: in the United States, smartphone use increased from 5% to 40% between 2009 and 2012 and continued to rise to over 90% in 2019.[18] Generative AI (which of course includes translation technologies) hit 100 million users globally in just two months.[19] This is data on unique visitors, that is, individual users who visit a website and are counted only once, regardless of how many times they return after the first access. Adoption patterns vary considerably by application area. In specialised, regulated, and risk-sensitive domains such as public sector interpreting, diffusion is likely to happen at a slower pace.

Despite this, usage of LLM-based tools is already extensive and continues to grow. Given that LLMs are fundamentally language technologies, their integration into interpreting-related tools is to be expected. Moreover, LLMs are only one component in a broader technological landscape that includes computer-assisted interpreting, remote interpreting platforms, and machine interpreting systems. Automatic interpreting is therefore likely to become increasingly capable and more widely used over time. It is nonetheless important to highlight that the window of opportunity to influence how and where such technologies are introduced has not yet closed.

The specific features of the Norwegian public sector interpreting landscape might also affect the diffusion of these technologies in Norway. As of today, the system seems to be in quite good health. Proof of this is the over one million interpreting assignments that take place in Norway annually. So even if the actors

[18] https://www.statista.com/statistics/489255/percentage-of-us-smartphone-owners-by-age-group/?srsltid=AfmBOopymruspqXvRJvyG7Pvp8ck3ytlfeLngP0K30c0F686NxQ1R_N0.

[19] https://www.theguardian.com/technology/2023/feb/02/chatgpt-100-million-users-open-ai-fastest-growing-app.

participating in interpreting processes may wish for higher availability of interpreters, better quality in interpreting, better systems, more economical solutions to save public money, and other improvements, the reality is that the current system works well. There is no burning need to introduce new technology into the field immediately, which means that slow transformations are more likely to occur than dramatic changes.

In addition, interpreters themselves are key actors with a high degree of professional autonomy. Interpreters largely retain discretion over whether and how they use technology to support their work. As a group, they are relatively cautious and express concerns about the quality of interpreting and ease of use of new language technologies, as well as the protection of personal data (see section 5.4). Even if there seems to be limited motivation to start using such tools, the discussions in section 5 (especially 5.4) show that some interpreters find them useful, and their use is spreading. Other actors in the system may find interpreting technologies generally useful but may find it more difficult to invest in such tools and require interpreters to use them.

From the perspective of public bodies or intermediaries, it is therefore challenging to mandate the use of technology or make large investments that depend on interpreter compliance. The limited success achieved by the effort to introduce video remote interpreting (see section 3.4.2) illustrates the problem. VRI is used to some extent, but it is in no way common in Norwegian interpreting assignments. The ongoing pilot projects testing out new technologies also show that it usually takes some time to move from proof of concept to full technological adoption.

Taken together, these factors suggest that the period up to around 2030 is unlikely to be characterised by radical or universal adoption of automatic interpreting technologies in the field of public sector interpreting in Norway. Uptake will occur, technologies will improve, and usage will expand in selected contexts, but widespread substitution of human interpreting is improbable in the short term.

This does not imply technological stagnation. On the contrary, interpreting technologies are already attracting a lot of attention, and developments elsewhere will continue to influence expectations and practices in Norway. The coming years, therefore, represent a critical window — not to deny or resist technological change, but to shape its trajectory through informed choices, risk-based governance, and controlled experimentation.

7.2 Purpose and criteria for future scenarios

The purpose of creating scenarios is not to predict the future, but to explore *how* events may unfold. The purpose is fundamentally to provide a frame of reference for discussions about the future, outside of what is obvious from linear forecasting. Scenarios are meant to raise awareness, inspire and spark discussions about the future, and create a common language for the stakeholders in the discussion.

Scenarios should be:

- Plausible
- Relevant
- Coherent in their internal logic

Scenarios should provide:

- Clear drivers, based on signals, trends, and uncertainties
- Contrasts between different plausible futures
- Actionable insights for policymakers, to a certain degree

Throughout this report, we have indirectly described various weak signals. In this section, we summarise and organise them into trends with an explicit explanation. The trends identified here are within the scope of Norwegian public sector interpreting and may or may not be generalisable to other settings.

The following trends with accompanying drivers have been identified:

Table 6 Summary of Trends

Trend	Drivers
Increasing use of AI (in the public sector and in general)	• This is a general trend, documented in reports about AI usage • Generative AI/LLMs have made breakthroughs that open up new use cases • General desire/hope that AI can be a cost-effective solution for the public sector
Technology providers entering the interpreting market	• Technology providers with translation capability are expanding their markets • Inventors are trying to develop new products for the market • Limited availability of interpreters creates "gaps" that these providers are trying to fill
Growing awareness of the potential of AI for public sector interpreting	• The number of non-interpreter-assisted encounters between public bodies and minority language users creates pressure for solutions • Free or inexpensive new translation technologies promise solutions • Already existing pain points in today's model lead actors to look for alternative solutions • Technology providers market these solutions
Encounters without an interpreter present being transformed into real-time speech-based MT-supported encounters	• There is a lack of qualified interpreters • Free/inexpensive free machine translation is available on several types of devices • Speech-to-text (STT) and text-to-speech (TTS) have increased in quality and availability • Public sector interpreting can be transformed as the quality, integration and ease of use of technological solutions increases
Interpreters increasingly using augmenting technology	• Technological advancements in these areas • Interpreters are already using mobile phones as a form of RI in most assignments. Other forms of RI can now follow • CAI has the potential to improve interpreted encounters through preparation and assistance • Interpreters are positive about augmenting technology

7.3 Scenario descriptions

The trends identified in the previous section form the basis of the scenario discussions below. Instead of discussing the role of each one of the trends in the different scenarios, here we describe the reasons why one or more trends contribute to shape a scenario, and the ways in which they do so.

<table>
<tr><th colspan="2">Scenario 1</th><th>Careful continuity: Interpreter-centred augmentation</th></tr>
<tr><td colspan="3">The Norwegian public sector interpreting landscape evolves cautiously. Public bodies prioritise compliance, managing risk and quality on the grounds of a relatively conservative interpretation of the Interpreting Act and the EU AI Act with limited use of regulatory flexibilities that could encourage the adoption of new technology.

Although technological tools mature and become available, the uptake and response approach emphasises “safe integration” of these tools rather than substitution of human interpreters. Digitalisation is concentrated around the articulation process (booking, preparation, documentation), but the interpreting task itself remains primarily human.

Augmentation acts as the moderator, enabling high-quality public sector interpreting supported by enhanced tools.</td></tr>
<tr><td rowspan="3">Drivers</td><td>Regulatory / Institutional</td><td>• The Interpreting Act, in combination with institutional guidelines and practices, secures the demand for qualified interpreters
• Persistent risks or uncertainty (EU AI Act) limit the uptake of technology in high-risk situations, and interpreters remain as the “humans in the loop”
• Once applied, the EU AI Act classifies all significant parts of public sector interpreting as high-risk and limits the use of machine interpreting/machine translation in a significant portion of encounters</td></tr>
<tr><td>Market / Technology</td><td>• The performance/quality of real-time machine interpreting plateaus, not achieving the robust quality required for front-line use
• Workflow, CAI and RI tools continue to mature</td></tr>
<tr><td>Societal / Organisational</td><td>• High institutional trust makes a gradual or careful development politically attractive
• Interpreters and professional bodies resist substitution/automation, but support augmenting and workflow-technologies
• Risk aversion in the public sector moderates the uptake of fully automated solutions</td></tr>
</table>

Future state	Interpreter-mediated encounters	• Human interpreters remain the default modality across health, justice, child welfare, police and immigration • CAI tools become commonplace, including glossaries, terminology extraction, document pre-loading, and automated note-support for preparation • Remote interpreting becomes more professionalised, with certified hubs and standardised platforms
	Non-interpreter-mediated encounters	• Machine translation is accepted for low-stakes, procedural interactions (appointment booking, logistics, basic guidance) • Clearer risk-based guidelines for when tools may be acceptable substitute interpreters • Adoption of MT-based solutions, but with safeguards
	Interpreter workforce	• Interpreter education integrates CAI literacy, risk assessment, and digital workflow competence • Demand for qualified interpreters remains high, with shortages persisting for A-C level interpreters (see chapter 6) • Workload becomes more efficient, but complexity increases as interpreters must operate hybrid tools
	Public sector	• Better oversight into grey-zone use of AI tools in lieu of interpreters in encounters. Updated and refined guidelines in line with technological changes • Public sector employees are (better) trained to use tools responsibly and to identify when an interpreter is required • The public sector maintains a diversity of suppliers, but with well-defined quality and security criteria • Improvements in booking/documentation processes, while still relying on human interpreters
Potential tipping points		• Major breakthroughs in MT or MI real-time accuracy • Significant adoption of specialised applications in certain sectors

Scenario 2		Risk-cognisant automation: Platformisation of public sector interpreting
The public sector interpreting landscape has shifted towards a hybrid model in which human interpreters continue to guide communication, while AI systems handle substantial portions of real-time language processing. The public sector follows a risk-based approach aligned with the EU AI Act: high-risk encounters keep interpreters firmly in the loop, whereas lower-risk settings incorporate semi-automated interpreting tools. As a result, the role of interpreters is evolving. They increasingly serve as supervisors, revisers, and system-configuration specialists — managing, tuning, and overseeing AI output rather than performing all language work directly. This hybrid model emerges because AI technology becomes sufficiently reliable to automate certain linguistic subtasks, but the complexity of public sector communication still requires human competence to direct, validate and contextualise the outputs. This is a middle path, combining technological optimism with institutional caution.		
Drivers	Regulatory / Institutional	• The EU AI Act's requirements incentivise risk-based allocation of human oversight, rather than a stricter/more conservative blanket ban or, in the other extreme, a free-for-all. • IMDi and sector authorities issue updated guidelines explicitly defining "acceptable automation thresholds"
	Market / Technology	• Significant improvements in speech recognition and real-time MT for low-resource languages • Widespread availability of dedicated AI tools for interpreting support • Better integration between STT–MT–TTS pipelines to enable high-quality translation between Norwegian and languages in demand (presumably dominated by low-resource languages)
	Societal / Organisational	• Persistent interpreter shortages (notably A–C level interpreters) create a demand for augmented workflows • Pressure on the public sector to reduce waiting times and improve service response • Market actors promote "semi-automated interpreting suites" as cost-effective solutions • Increased digital maturity among interpreters • Growing comfort with hybrid AI–human workflows in the public sector. Illustrated, for example, by the widespread acceptance of TTS-based documentation in healthcare and other services that record encounters • Cost-reduction pressure in the public sector is affecting the use of interpreters

Future state	Interpreter-mediated encounters	• Interpreters routinely use AI as a co-pilot:
		  ○ real-time captions/subtitling
		  ○ automated terminology suggestions
		  ○ domain-specific memory support
		  ○ real-time rephrasing/monitoring
		• AI handles routine utterances while humans handle nuance, ambiguity, context and risk

	Non-interpreter-mediated encounters	• AI translation is the default in many situations (NAV, municipal services, hospital logistics)
		• Interpreters provide on-demand supervisory support for problematic or escalated cases
		• A triage system emerges based on risk and complexity:
		  ○ Tier 1: Fully automated, for low-stakes interactions
		  ○ Tier 2: Semi-automated with interpreter monitoring
		  ○ Tier 3: Human-interpreted encounters only
		• Potential for greater consistency in non-interpreter mediated encounters (consistent technology), but higher risk of errors through increased use of technology (where technology is replacing interpreters)

	Interpreter workforce	• The interpreting profession becomes more technological • Training is redesigned to include profession-specific AI literacy, error detection, bias awareness, risk assessment and other "new" competency requirements to support oversight • Further bifurcation of demand: hybrid vs. traditional interpreters • Escalation mechanisms and oversight roles may change the business model, perhaps towards more platform-inspired working conditions
	Public sector	• Faster access to an interpreter (or interpreter-equivalent alternatives) for routine communication • Public bodies shift to a multi-layered service model with AI handling high volumes and interpreters intervening when risk increases • Sector differences emerge: justice and health remain conservative, while NAV and municipalities move faster
Potential tipping points		• Lack of qualified interpreters • Interpreter adoption of CAI • Quality of interpreting deemed sufficient by society • Widespread availability of dedicated AI tools for interpreting support

Scenario 3		Automation outpaces the profession
Machine translation (MT) and speech-to-speech technologies have advanced to a point where their fluency, domain adaptation, and reliability make them the default choice for multilingual communication across society. In this scenario, these technologies fall partly outside the EU AI Act's strictest "high-risk" categories because they are classified as translation tools rather than automated decision-making systems. This creates a regulatory blind spot: widespread use of real-time machine translation is allowed in many settings as long as humans remain accountable for any subsequent decisions. Public-sector organisations embrace MT to cut procurement costs, improve access to services in low-resource languages, and meet efficiency targets. As more non-interpreted encounters and low-stakes interpreter-mediated encounters shift to automated translation tools, the number of assignments available to human interpreters declines. This makes it economically unsustainable for many interpreters to remain in the profession. Training and certification pipelines begin to contract as a result. With fewer qualified interpreters available, even high-risk sectors start relying more heavily on machine translation simply because "there is no one left to call." This produces a self-reinforcing contraction loop: declining demand → interpreters leave the profession → reduced supply → greater MT adoption → further erosion of demand. Human interpreters remain only in a few specialised niches, while machine translation becomes the backbone of multilingual communication — even within the public sector. This is a highly disruptive, technologically optimistic but socially destabilising path. The disruption is quality-driven: the new solution is good enough in large parts of the system to replace what it disrupts.		
Drivers	Regulatory / Institutional	• Machine translation tools are not categorised as high-risk systems under the EU AI Act when used as input support, enabling rapid uptake across sectors • Lack of explicit regulation for MT use leads to fragmented but permissive adoption • Public sector efficiency mandates, such as cost reduction and response time pressure, favour automated solutions • Weak enforcement capacity for monitoring grey-zone use of MT in sensitive encounters
	Market / Technology	• Breakthroughs in domain-specific MT, driven by fine-tuning to the specific needs of Norway and multilingual speech models • Commercial vendors shift their business models from interpreter platforms to automated translation-as-a-service • Cost asymmetry: MT is effectively free to use, while human interpreters remain scarce and expensive • Improved speaker attribution and TTS naturalness reduce barriers for real-time use
	Societal / Organisational	• Public officials become accustomed to "instant translation" interfaces and see them as good enough • Minority-language speakers increasingly rely on commercial tools (e.g., phone apps), normalising MT

		• The interpreter workforce becomes fragmented, with many leaving due to unstable income streams • Organisations perceive human interpreting as complicated, slow, and administratively heavy compared to MT
Future state	Interpreter-mediated encounters	• Human interpreters are used in narrow, specialised domains • Demand far outpaces supply, even for "larger" languages • Shortages force partial (unwanted) reliance on tools rather than interpreters, potentially even against policy/recommendations
	Non-interpreter-mediated encounters	• MT is the "universal" default • Real-time MT/MI are embedded in video platforms and apps, also in household devices
	Interpreter workforce	• The number of qualified interpreters available for several languages declines when income becomes unstable • The core of the profession turns towards oversight-type roles • Agencies embrace becoming AI integration providers, providing technology and interpreters as language consultants/revivers

	Public-sector	• Public bodies restructure multilingual services around automated translation infrastructure
		• Risk assessments become procedural but are rarely decisive in limiting deployment
		• Data considerations grow
		  ○ Vast amounts of public sector speech are processed by external vendors
		  ○ Privacy and security depend on contractual safeguards rather than institutional control
		  ○ Quality assurance shifts from human oversight to statistical confidence scores

Potential tipping points		• Breakthrough in real-time multilingual speech models (e.g., ChatGPT-style audio-to-audio reasoning) with near-human accuracy • Successful implementation in a major sector (e.g., NAV or hospitals) demonstrates 80–90% success in routine tasks, triggering political enthusiasm for scaling • Normalisation in society, where people increasingly prefer or expect MT as the fastest option • Not enough interpreters available

Scenario 4		The failed transition: Automation for the wrong reasons
Public sector organisations face persistent financial pressure, staffing shortages, and growing demand for multilingual services. Interpreting budgets are repeatedly cut. At the same time, widely accessible commercial translation apps improve enough to appear superficially "good," particularly in demos and pilot projects. Political narratives increasingly emphasise efficiency, self-service, and digital uniformity. Crucially, real-time translation tools fall into a regulatory grey zone: framed as communication support rather than decision-making systems, they fall outside the EU AI Act's strictest oversight requirements. The transition is not driven by genuine technological readiness. Instead, it is propelled by misaligned incentives: cost-cutting pressures, procurement shortcuts, and the belief that "something is better than nothing." Early pilots fail to identify harms because they measure superficial usability rather than core quality and accuracy. The interpreter labour pool then shrinks rapidly, not because MT truly replaces human interpreters, but because the surrounding system can no longer sustain interpreting as a viable profession. This normalises the use of low-quality MT in situations that previously relied on qualified interpreters. Minority-language speakers experience declining service quality, more frequent misunderstandings, and a higher risk of incorrect decisions. The result is a degraded ecosystem where machine interpreting becomes dominant not because it works, but because no viable alternative remains. This is a highly disruptive, technologically pessimistic and socially destabilising path. The disruption is failure-driven and low-quality.		
Drivers	Regulatory / Institutional	• Loopholes and grey zones in the EU AI Act allow real-time MT to be deployed without being classified as a high-risk system • Weak enforcement capacity: no systematic auditing of automated interpreting use • Budget-driven procurement prioritises cost over quality and ignores long-term workforce sustainability • Fragmented governance: local municipalities make independent decisions, leading to uneven practices and inconsistent safeguarding practices • Pressure for digitalisation overrides risk evaluations
	Market / Technology	• Consumer-grade apps become "good enough" for public-sector decision-makers, despite inconsistent accuracy • Vendors market AI interpreting solutions with inflated claims and limited validation • Lack of high-quality, Norwegian-domain datasets leads to systematic MT weaknesses, especially when paired with low-resource languages • Public opinion misinterprets confidence scores as indicators of truth, reinforcing misplaced trust
	Societal / Organisational	• Public sector employees become accustomed to automated solutions and lose practical experience in working with interpreters • Minority language users increasingly rely on commercial apps themselves, normalising low-quality communication loops

		• Organisations adopt MT due to convenience, speed and low administrative burden, even when it reduces communication quality • The cultural shift towards self-service and automation devalues real linguistic expertise
Future state	Interpreter-mediated encounters	• Human interpreters become rare and often unavailable on short notice • MT is used even in medium and high-risk interactions because public bodies "have no other choice"
	Non-interpreter-mediated encounters	• Misinterpretations in health, justice, social welfare and child protection services accumulate, but remain largely invisible due to poor logging and oversight • MT becomes the default even when it is ill-suited for the context • Public officials prioritise speed over accuracy, often unaware of errors or biases
	Interpreter workforce	• No sustainable career pipeline exists. The workforce collapses in both availability and competence
	Public sector	• Public organisations become locked into vendor ecosystems, unable to revert to human-led services • Legal safeguarding systems erode in practice, even if the Interpreting Act formally remains unchanged • Differences between sectors widen: some adopt MT aggressively, while others struggle to maintain minimum service levels
Potential tipping points		• Large-scale budget cuts beyond normal cost sensitivity affecting municipalities or health services push the rapid adoption of automated tools • Interpreting Act guidelines are not updated, allowing gradual substitution to escalate unchecked • Public sector normalises using consumer apps because "everyone else does it" • Closure of interpreter education programmes due to low enrolment rates and poor job prospects

7.4 Scenario summary

To help synthesise the four scenarios, we have purposefully constructed them along two key axes: technological capability (low and high) and governance quality (from strong institutional stewardship to weak or misaligned adoption). Together, they represent four potential corners of a plausible future space. Taken together, the scenarios cover a strategic landscape, including best-case to worst-case pathways.

Table 7 Scenario summary along the capability and governance axis

Level of Technological capability and involvement	**Scenario 3:** High-quality MT/MI as a disruption and as a (partially) successful transformation: the transformation is technologically successful but may bring a potentially negative system-disruptive future.	**Scenario 2:** High-quality MI as a tool primarily for interpreter-mediated encounters. Careful introduction in low-risk settings. Primary market and technology that is restructuring/reforming the ecosystem. Governance regulates the pace of the restructuring.
	Scenario 4: Low-quality MT/MI is used and becomes a disruption, creating a failed transformation that causes professional collapse. Regulatory/governance failure as a contributing factor. Governance failure and system degradation.	**Scenario 1:** Technologically speaking, primarily limited to augmentation. Limited MI use due to low quality. Using regulation to conserve high-quality in public sector interpreting through regulating the quality of the technology allowed to automate.
	Level of regulation/governance/active stewardship	

From the perspective of the Norwegian public sector, the most obvious dimension to regulate is governance. Taking responsibility and providing clear governance would reduce risks and create the conditions for the most desirable scenarios. At first glance, the role of the Norwegian public sector in shaping technology choices appears limited, since most technological development takes place outside Norway and is largely beyond governmental control.

However, technological development will take many forms and deciding which MI solutions to use for which purposes may be crucial for ensuring the adoption of high-quality technologies. The key question is not whether high- and low-quality technologies will exist, since MI solutions already exist and will continue to evolve. The critical issue is which technologies will be *used*. Selecting high-quality solutions is an area where the government and the wider public sector can play a significant role: by defining what “high quality” means and promoting the use of high-quality technological solutions.

8 Recommendations

In this report, we have analysed the development of technology and market actors, as well as interpreters' reactions to these developments. While we believe that technological developments will change the field of public sector interpreting in Norway, we also think that there is enough time to react and shape how the new technology is applied to support the overall goals of the Interpreting Act. The four scenarios described in the previous chapter outline four possible future outcomes. The recommendations in this chapter should be understood as guidance for both governance-driven scenarios and for steering the adoption of high-quality technological solutions.

The recommendations are divided into three main pillars. These three areas are not mutually exclusive; rather, they are interdependent. Their order does not indicate priority, and actions in one area are expected to influence the others.

Governance and decision capacity focuses on strengthening the government's ability to exercise effective governance in matters related to interpreting and technology. If the weak-governance scenarios are to be avoided, this capacity must be reinforced. This pillar contains three recommendations.

Quality and risk control recommendations have two main aims. The first is to improve current work processes and ensure that interpreting assignments are managed correctly and efficiently. The second is to clarify what constitutes high-quality interpreting technology and, through that process, define standards that developers can use to guide innovation and that technology users can rely on for informed decision-making.

Competence and professional sustainability concern the development of the entire ecosystem needed for a future with greater technological integration. This is the most long-term set of recommendations, but it is essential for ensuring that the system remains sustainable. This pillar also contains two recommendations.

Table 8 Recommendations

Pillar 1 Governance and decision capacity	Pillar 2 Quality and risk control	Pillar 3 Competence and professional sustainability
Making evidence-based decisions based on multiple sources Developing a common policy regarding machine translation and interpreting Monitoring grey zones, such as settings in which interpreters are not normally used despite language barriers	Improving assignment workflow processes Developing quality standards for interpreting tools	Fostering research on new technology and strengthening curricula in interpreter education Enhancing practising interpreters' technological competence

The recommendations are intended for all actors in the ecosystem: IMDi, public-sector organisations, technology developers, interpreting educational institutions, interpreters, interpreting agencies, and other relevant stakeholders. Some recommendations naturally target specific actors more than others: strengthening curricula on new technologies, for instance, is primarily a task for educational institutions. However, even these efforts benefit from collaboration and input from the wider ecosystem. The same applies to the joint development of a common policy for machine translation. Governmental agencies must lead this process, but they cannot (and should not) do so alone. Effective policy development requires coordinated contributions from all involved parties.

Finally, competence and professional sustainability must be strengthened at multiple levels. If technology is expected to play an increasingly important role, interpreter education must ensure that interpreters understand how these technologies work, when they should or should not be used, and what risks and benefits they entail. At the same time, many interpreters who will be active over the next five to fifteen years are already in the profession. Strengthening the technological competence of current interpreters and systematically incorporating their experiences and needs is therefore essential: Interpreters should also be included in structured dialogue on technological development, as their practical experience can influence both design choices and emerging standards.

8.1 Pillar 1: Governance and decision capacity

Firstly, concerning governance and decision capacity, there is a clear need for systematic, evidence-based decisions. Relevant evidence is generated across the public sector interpreting ecosystem, including public bodies, interpreters, training institutions, technology providers, and research. IMDi should continue to collect and synthesise this knowledge through instruments such as Tolkemonitor and complementary sources, and use it actively to guide policy and operational choices.

Secondly, effective governance requires joint development across the ecosystem. Several parts of the public sector, particularly healthcare services and the police, already conduct encounters with minority speakers without interpreters present and are experimenting with machine interpreting. This requires support from IMDi for competence development related to the Interpreting Act, as well as awareness of technological possibilities, limitations, and risks. These dynamics point to the need for coordinated development of a shared policy on machine translation and machine interpreting, developed in dialogue with relevant public bodies and stakeholders.

Thirdly, making the right decisions also requires attention to what happens around the core business. Today, interpreting sometimes proceeds without a human interpreter; those interested in interpreting should monitor and follow this development.

8.1.1 Making evidence-based decisions based on multiple sources

Evidence-based practice is a central conclusion of this report. As the range of available technologies expands, the interpreting ecosystem faces increasingly complex decisions — not only about which tools exist, but about when, where, and under what conditions they should be used. These decisions cannot be guided solely by technological claims or ad hoc experimentation. Systematic knowledge is essential to upholding quality, legal, and ethical standards and maintaining trust in public services.

An explicit evidence base also supports legitimacy and acceptance. Decisions grounded in documented experience and analysis are more likely to be understood, implemented, and sustained across organisations and professional groups. Developing such a knowledge base requires continuous collection and analysis of evidence across the themes addressed in this report.

This work cannot be undertaken by a single actor. IMDi already plays a key role through instruments such as the Tolkemonitor reports, which provide insight into the volume and types of interpreter assignments. However, further evidence is needed on technological developments, on encounters where interpreters are not used, and on how these practices influence patterns of technology adoption.

8.1.2 Developing a common policy regarding machine translation and interpreting

There is currently no clear, shared guidance on what constitutes appropriate and responsible use of machine translation or machine interpreting in public sector contexts. In the absence of such guidance, technology is being introduced incrementally and unevenly, often through local experimentation or pragmatic workarounds. This creates a risk of practice evolving without any explicit consideration of legal safeguards, quality requirements, or the cumulative effects on interpreting provision, thereby expanding grey zones and producing unintended consequences. There is nothing in the Interpreting Act that covers this, but § 8 opens for future development.

A jointly developed policy framework is therefore needed to provide clear expectations for when, where, and under what conditions technology-based translation or interpreting solutions may be used. Such a policy should be grounded in evidence and explicitly address both the potential benefits and the limitations of current technologies, including risks related to accuracy, accountability, data protection, and user trust. It should also clarify the relationship between machine-based solutions and the obligations set out in the Interpreting Act, particularly in high-risk and high-consequence encounters.

Policy is a central instrument for shaping not only compliance but also the direction and pace of technological change. While new technologies are likely to influence public sector interpreting over time, their impact is not predetermined. Through coordinated policy development (in dialogue with public bodies, professional representatives, and relevant stakeholders) the public sector can steer technology use towards augmentation and responsible integration rather than unregulated substitution. IMDi can take the lead, but without the active participation of other agencies, a joint policy is not possible.

8.1.3 Monitoring grey zones and encounters without an interpreter despite language barriers

The Interpreting Act is intended to address public-sector communication where language barriers exist. As discussed previously, not all such settings include an interpreter, nor should they. However, defining when an interpreter is needed and what level of competence is required is difficult. A large, expanding grey zone persists between encounters that require an interpreter and those that do not, and it warrants closer investigation.

In some sectors, this situation is so prevalent that they have already begun experimenting with machine interpreting and automatic translation. As discussed earlier, machine interpreting makes these decisions more difficult and more risk-prone; however, if used carefully, it might also alleviate the need for interpreters.

Without systematic monitoring, technology use may gradually reshape practice in ways that undermine the objectives of the Interpreting Act. We therefore recommend that IMDi strengthen its evidence-gathering role by drawing on multiple sources across the ecosystem to support informed, proportionate, and accountable decision-making. IMDi might be interested in taking a lead role here, particularly in gathering information and developing an overview of the situation.

8.2 Pillar 2: Quality and risk control

There are two key elements in this pillar. The first is to strengthen and refine the existing processes surrounding public sector interpreting. With more than a million assignments each year, these processes are critical and will remain so for the foreseeable future.

The second element is to define what constitutes quality across the various available —and emerging— technologies. The rapid pace of development, combined with the sheer diversity of tools with different strengths, weaknesses, and risk profiles, creates a clear need for shared quality standards. While actors are aware of the fast technological evolution and of the claims made by technology providers, they often lack a common framework for assessing suitability and risk. Developing quality standards for interpreting technologies would provide such a framework and support consistent, responsible use across sectors.

8.2.1 Improving assignment workflow processes

Given the high volume of interpreting assignments and the large number of actors involved, the interpreting assignment workflow constitutes a critical infrastructure in its own right. It requires continuous improvement, regardless of the introduction of new interpreting technologies. Digital tools are already embedded in the workflow, and this development continues; IMDi, for example, is currently working on improvements to the National Registry.

However, the workshops with relevant stakeholders revealed a number of persistent pain points across actor groups. Public bodies reported difficulties in identifying appropriately qualified interpreters for specific assignments, as well as challenges in the practical processes of requesting and booking interpreters. Interpreters, in turn, highlighted limited access to relevant information and preparatory documents as a major barrier to performing assignments effectively. More broadly, shortcomings in existing booking systems were identified, including limited visibility into interpreter availability and access to up-to-date calendars.

8.2.2 Developing quality standards for interpreting tools

As interpreting technologies mature, the central question is no longer whether such tools exist but how to assess their quality and suitability. Claims about benefits often outpace systematic evaluation, and without shared standards there is a risk of both inappropriate adoption driven by technological optimism and unnecessary rejection fuelled by uncertainty. For IMDi and other actors in the public sector interpreting ecosystem, there is therefore a clear need to establish quality standards or assessment criteria for interpreting tools used in public sector contexts.

The purpose of such standards is not to promote or prohibit specific technologies, but to provide a common basis for evaluation and responsible decision-making. At minimum, any assessment framework should address three core dimensions: usability in realistic field settings, translation accuracy for relevant languages, and data management and privacy.

Usability in actual interpreting settings

Interpreting is time-critical work performed under variable and often demanding conditions. Technologies designed to augment or automate interpreting must therefore function reliably in real-world settings, not only in controlled test environments. Assessments should consider whether tools can be used effectively during live encounters, including their integration with existing systems, sound quality, ability to handle multiple languages and speakers, availability of support functions, and the cognitive load placed on interpreters. These criteria require operationalisation and testing in realistic field conditions, and minimum thresholds for acceptable performance should be clearly defined.

Accuracy of translation

Translation and interpreting quality vary significantly across languages, particularly between high-resource and low-resource language pairs. While performance is relatively well documented for some major languages, there is limited evidence on the quality of machine interpreting involving Norwegian and smaller minority languages. Any quality standard must therefore take language-specific performance into account, drawing on available information about training data, documented accuracy in written translation, and testing of live interpreting conducted by qualified interpreters. A necessary first step is to consolidate existing testing efforts and results, where they exist, to avoid duplication and support cumulative knowledge building.

Data management and privacy

Quality assessment must also encompass compliance with privacy and data protection requirements. Interpreting technologies used in public-sector encounters process sensitive information, often in high-risk contexts. Evaluations should therefore include clear criteria for data ownership, storage location, built-in privacy and GDPR safeguards, deletion practices, and the availability of risk analyses or other documentation that supports responsible use.

8.3 Pillar 3: Competence and professional sustainability

Throughout this report, we have repeatedly emphasised the importance of understanding the landscape of translation and interpreting technologies. This is a core responsibility of educational institutions, but they should be supported by other actors in determining what competencies are needed.

8.3.1 Fostering research on new technology and strengthening curricula in interpreter education

Interpreter education and professional development must adapt to a technological landscape in which digital tools and artificial intelligence are becoming integral to interpreting practice. In Norway, university-level training in public sector interpreting already makes extensive use of digital solutions, both due to the hybrid structure of the programme and as a deliberate pedagogical choice. Students are introduced to a wide range of interpreting modes, settings, and technologies, including remote interpreting, terminology-management tools, digital performance analysis, and selected applications of generative AI. Crucially, the training emphasises not only technical proficiency but also critical reflection on ethical, legal, and data-protection implications.

Looking ahead, core interpreting competencies such as language mastery, memory, methodological command, and rhetorical skills remain unchanged. However, new technologies offer opportunities to strengthen these competencies during training and, in some cases, in professional practice. Training institutions should therefore continue to explore tools that support skill development and preparation, provided their use is grounded in critical assessment, evidence, and strict data-protection standards. Interpreters must also be able to assess the risks associated with technology use, particularly in public-sector contexts where confidentiality and legal safeguards are essential.

At the same time, interpreter education must prepare students for a changing professional landscape. While the extent to which AI may substitute human interpreters remains uncertain, new professional roles are already emerging, including functions related to quality assurance, revision, and advisory work on AI-based language technologies. Training programmes should therefore ensure that future interpreters develop sufficient technological literacy to participate meaningfully in decisions about augmentation and automation that shape their profession.

8.3.2 Enhancing practising interpreters' technological competence

Educational institutions play a key role in ensuring that public bodies provide qualified interpreting in accordance with the law. Many practising interpreters completed their training before the recent technological shift and therefore require ongoing opportunities to build competence in digital tools, AI literacy, and risk-based decision-making. Although empirical knowledge about current technology use among interpreters remains limited, available evidence suggests that a substantial share already relies on AI-based tools. Continued dialogue, targeted competence-building initiatives, and closer collaboration between training institutions, professional associations, and public authorities are therefore essential.

In a field where professional consolidation is uneven internationally, strengthening interpreters' technological competence must go hand in hand with reinforcing professional standards, improving professional visibility, and ensuring active participation in governance and policy discussions related to the use of technology in interpreting.

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Appendix A: Sources for market scan

The list of the interpreting market was created using the following references:

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