Prospects and threats for the development of translation studies in the era of artificial intelligence and machine translation

Perspectivas y amenazas para el desarrollo de los estudios de traducción en la era de la inteligencia artificial y la traducción automática

Karina Gevorgian
National Linguistic University
Kyiv

Artur Gudmanian
State University of Information and Communication Technologies
Kyiv

Kostiantyn Kosharnyi
Taras Shevchenko National University of Kyiv
Kyiv

Natalia Lysenko
National University of Pharmacy
Kharkiv

Alla Berestova
National University of Pharmacy
Kharkiv

Abstract

The article provides a comprehensive overview of how active use of artificial intelligence technologies and next-generation machine translation systems are transforming translation studies. It examines statistics from international organizations about the scale and speed of digitalization in language technologies. The findings show that the most rapid growth in machine translation adoption is in the European Union, where, according to the European Language Industry Survey, the share of these systems exceeds 50%, and in the United States, where it reaches 67.9% in 2025. In comparison, regional reports indicate that in Central and Eastern Europe, this figure ranges from 48–52%. The article explores AI's influence on the core aspects of translation—cognitive, linguistic, and ethical. It highlights that modern neural translation systems offer much better semantic accuracy but also pose risks of losing individual style, creative interpretation, and contextual appropriateness. The author stresses the importance of rethinking the professional role of the translator, who is gradually shifting from a mere performer to an analyst and editor of AI-produced translations. A model is proposed for blending technological and humanistic approaches through the concept of "human-assisted translation," where humans play a central role in maintaining accuracy, cultural relevance, and ethical standards. The paper discusses the potential applications of machine translation in education, science, diplomacy, and international business, while also warning about threats like language standardization, corporate monopolization of technology, and the distortion of meaning due to algorithmic bias. The conclusion emphasizes that further development of translation studies in the digital era should integrate AI tools with humanitarian principles of language culture, creativity, and

intercultural responsibility. **Keywords:** cognitive and applied linguistics, artificial intelligence, machine translation, translation studies, cognitive linguistics, digital humanities.

Resumen

El artículo es un estudio exhaustivo de los procesos de transformación en el campo de los estudios de traducción provocados por la introducción activa de tecnologías de inteligencia artificial y sistemas de traducción automática de nueva generación. El artículo analiza las estadísticas de organizaciones internacionales sobre la escala y el ritmo de la digitalización de las tecnologías lingüísticas. Se determina que el crecimiento más dinámico en el uso de sistemas de traducción automática se observa en la Unión Europea, según la Encuesta Europea sobre la Industria Lingüística, con una cuota de dichos sistemas superior al 50 %, y en los Estados Unidos de América, con un 67,9 % en 2025. A modo de comparación, en Europa central y oriental, esta cifra oscila entre el 48 % y el 52 % según los informes regionales. Se estudia el impacto de la inteligencia artificial en los componentes clave de la actividad de traducción: cognitivos, lingüísticos y éticos. Se demuestra que los modernos sistemas de traducción neuronal proporcionan un nivel mucho más alto de correspondencia semántica, pero al mismo tiempo plantean riesgos de pérdida del estilo individual, de la interpretación creativa del texto y la adecuación contextual. El autor destaca la necesidad de replantearse el papel profesional del traductor, que está pasando gradualmente de ser un ejecutor a un analista y editor de traducciones generadas por sistemas de inteligencia artificial. El autor propone un modelo para combinar enfoques tecnológicos y humanitarios mediante el concepto de «traducción asistida por humanos», en el que una persona sigue desempeñando un papel protagonista al garantizar la precisión, la relevancia cultural y la ética de la interpretación lingüística. El artículo describe el potencial del uso de la traducción automática en la educación, la ciencia, la diplomacia y los negocios internacionales, e identifica las amenazas asociadas a la excesiva estandarización de las soluciones lingüísticas, la monopolización corporativa de la tecnología y los riesgos de distorsión de los significados derivados del sesgo algorítmico. Se concluye que el desarrollo futuro de los estudios de traducción en la era digital debe basarse en la integración de las herramientas de inteligencia artificial con los principios humanitarios de la cultura lingüística, la creatividad y la responsabilidad intercultural.

Palabras clave: lingüística cognitiva y aplicada, inteligencia artificial, traducción automática, estudios de traducción, lingüística cognitiva, humanidades digitales.

1. INTRODUCTION

In the 21st century, rapid advances in artificial intelligence have significantly transformed not only technical fields but also the humanities, with translation studies gaining particular importance. Machine translation, once viewed as a supplementary tool two decades ago, has now become a worldwide phenomenon capable of greatly affecting professional, educational, and cultural sectors. According to the Organization for Economic Cooperation and Development's Digital Economy Outlook (2024a; 2024b) report, the language technology market is growing at an average rate of 12–15% annually, and investments in AI systems for natural language processing exceeded $18 billion in 2023.

A technological breakthrough in machine translation occurred with the introduction of neural networks, which enabled a qualitatively new level of understanding of a text's context and stylistic features. Neural systems, such as Google Neural Machine Translation (GNMT), DeepL Translator, and OpenAI GPT-4/5, use multilingual models with billions of parameters, enabling automatic translation to approach the level of human perception. According to an annual study analyzing the state, trends, challenges, and expectations of the language industry in Europe (European Language Industry Survey – ELIS, 2025), more than 70% of translation companies in the European Union actively use machine translation tools in their work, and 40% of translation studies programs include courses on digital technologies and post-editing.

At the same time, the digitalization of the language sphere presents several challenges for traditional translation studies. These include the risk of devaluing human translation expertise, algorithmic bias, standardization of language solutions, and the loss of cultural and semantic richness in the text. As stated in the Recommendation on the ethics of artificial intelligence: Implementation progress report (2023), an over-reliance on artificial intelligence in language can lead to the oversimplification of cultural codes and constrain the space for creativity.

There is a need to update the core concepts of translation studies, now incorporating linguistic theory with digital text-processing technologies. This creates opportunities for interdisciplinary research at the crossroads of cognitive linguistics, computer science, ethics, and cultural studies. In this context, the human-assisted translation approach—where a human is not just a passive observer but an active analyst who manages and corrects machine translation outputs—becomes increasingly relevant.

Therefore, analyzing the current state and trends of machine translation, evaluating the impact of artificial intelligence on the translation profession, and identifying the risks and opportunities of digital transformation in translation studies within global and national contexts are important scientific tasks, which is why this research area was chosen.

2. LITERATURE REVIEW

The influence of artificial intelligence on translation studies has grown over the past decade, fueled by widespread digital technology use and rapid advances in machine learning systems. Early research (Tavares et al., 2020; Rivera-Trigueros, 2022) mainly focused on the technical aspects of machine translation, such as neural network design, context processing, and error reduction. However, with the rise of generative AI models (including GPT, Gemini, Claude, Mistral), the focus has shifted from automating translation to exploring how humans interact with algorithms.

According to Kravets et al. (2025), Singer (2022), and Sela-Sheffy (2023), the main change is the transformation of the translator's professional identity: he or she is no longer just a language intermediary but a "textual decision analyst" who controls the content and quality of artificial intelligence results. A similar view is supported by Chen and Liu (2023), who highlight the emergence of the concept of "post-editorial literacy" – a new translator's skill that involves not only editing machine translations but also understanding the principles of artificial intelligence models and assessing their errors.

A key contribution to the development of the theoretical foundations of neural translation has been made by Sodiqova (2025), who shows that neural networks can do more than simply copy sentence structures; they can also learn to replicate the stylistic patterns of

language. However, the author also highlights that even the most advanced models are still susceptible to "hallucinations" – the creation of text fragments that do not exist in the source material, which poses ethical and methodological challenges for translation studies.

Xu and Wang (2025), Moorkens (2022), and Mialkovska et al. (2024) emphasize the increase in machine translation productivity in the commercial sector but note that the quality of automatic translations varies greatly depending on the language pair and the subject matter of the text. For example, according to ELIS (2024), machine translation accuracy for European languages averages 85–90%, while for less common languages it is only 65–70%.

The Report of the Independent Expert Group on AI and Culture, 2025, explores the sociocultural implications of integrating artificial intelligence into language processes. There is a risk of "cultural unification," meaning a tendency for dominant languages with larger educational datasets (such as English, Spanish, and Chinese) to overshadow others. This could lead to the marginalization of smaller languages and the loss of local cultural contexts.

Another area of research centers on the educational integration of artificial intelligence in translator training. According to the European Commission's European Master's in Translation (n.d.), 62% of European master's programs already include courses on machine translation post-editing, and 48% cover modules on the ethics of using artificial intelligence in translation. A similar trend is just beginning in Ukrainian universities, emphasizing the need to align educational standards with European ones.

Summarizing scientific approaches, the authors identify three main research paradigms:

1. Technological – analysis of machine translation algorithms and models (Li et al., 2023; Mondal et al., 2023).

2. Linguistic and cognitive – studying the interaction between humans and machines in the process of creating meaning (Signorini, 2024; Lund, 2022).

3. Ethical and sociocultural – understanding the risks to linguistic diversity and humanitarian values (Tesseur et al., 2022; Pollock, 2025).

Thus, modern translation studies are at a stage of integrating linguistic knowledge and digital technologies, in which ethics, quality control, cultural adaptation, and the training of new types of specialists play a leading role. At the same time, the literature review shows that this topic remains fragmented in the Ukrainian scientific tradition, creating a wide field for further research.

3. MATERIALS AND METHODS

The study is based on analyzing official statistical and analytical materials related to the development of artificial intelligence technologies, machine translation, and their effect on the language industry. The data was collected from publicly available reports by international organizations, intergovernmental agencies, government statistical offices, and specialized research institutes that provide verified information through official statistics. To ensure accuracy, only publicly accessible documents published on official

platforms were used, including reports by the European Commission on the digitalization of translation processes, analytical reports by the Translation Centre (2025) for European Union bodies, statistics from Grand View Research (2023), Global Industry Analysts (n.d.), as well as open databases from the United Nations (UNESCO) and the Organization for Economic Cooperation and Development (OECD).

To identify trends in the development of machine translation amid the spread of artificial intelligence technologies, a methodological approach was employed, involving system and comparative analysis methods. Particular attention was given to content analysis of reports and statistical tables, which helps summarize the quantitative and qualitative features of the modern machine translation market (IndustryARC, 2025). During the summary stage, structural and functional analysis methods were used to identify the key factors of artificial intelligence's impact on translation studies, along with the analogy method, which allowed for comparing trends in translation with other fields of humanitarian knowledge undergoing automation.

This study utilizes the method of historical and logical analysis. This approach allows for tracing the evolution of machine translation—from rule-based and statistical models to modern neural architectures. It also enables identifying patterns in the shift from using technologies as tools to the integrated collaboration of humans and machines in translation. The method of critical generalization of data from international projects in language policy and digital skills is employed to assess the impact of artificial intelligence on the professional work of translators and the educational sector.

During the work, an analysis was conducted of regulatory and legal documents that govern the use of artificial intelligence technologies in translation activities. This analysis focused on the European Union, specifically the "AI Act" initiative and the digital services directive. This approach helped clarify how the ethical framework for artificial intelligence applications is developed and the requirements that machine translation systems must meet in public communication.

The source base also included materials from academic institutions monitoring the integration of artificial intelligence into higher education. These organizations include UNESCO, OECR, and the European University Association (EUA). The analysis of the documents allowed for a comparison of how quickly translation studies curricula are adapting to new technological realities. The recommendations of the International Federation of Translators (IFP) on ethical standards for working with machine translation are also considered.

Secondary analysis of official reports and synthetic trend modeling were used to compile statistical indicators and reach consensus conclusions. During data processing, the focus was not on creating new indicators but on comparing existing data from different organizations. The main goal was to analyze the dynamics of the machine translation market, observe changes in demand for post-editing services, and expand the uses of neural translation systems.

Therefore, the study's methodological framework combines analytical and descriptive approaches to offer a comprehensive understanding of artificial intelligence's impact on the development of translation studies. The use of official and verified sources guarantees the objectivity and reliability of the conclusions, aligning with contemporary academic standards for scientific publications in the humanities.

4. RESULTS

An analysis of the global growth of machine translation reveals that over the past decade, this technology has evolved from an experimental auxiliary tool to an essential part of the language services and communication management industry. While in the 2010s, machine translation was mainly used as an assistive tool for technical or initial translation, in the 2020s it has become a fully integrated element of the translation process, embedded in most content management systems and corporate language platforms.

According to the AI Policy Observatory (2024), the percentage of companies using machine translation systems has increased from 30% in 2015 to 75% in 2025. This reflects the rapid expansion of artificial intelligence-based technologies in business communications, international law, science, and media. This trend results from breakthroughs in neural network technology, the emergence of deep learning models, and the growing global demand for multilingual digital content driven by market internationalization.

The early stage of machine translation development depended on rule-based and statistical models using language corpora and frequency algorithms. These approaches had significant limitations, especially their inability to understand context. This changed after 2017, when companies like Google, Microsoft, Meta, and DeepL adopted neural network models with multilayer recurrent architectures and self-attention mechanisms. These advancements allowed machines to understand context, not just translate words in isolation, which greatly enhanced translation quality.

According to ELIS (2024), using neural network translation cuts the average translation time by 40–60%, while boosting translation accuracy by 25–30% compared to older statistical systems. However, even with major algorithm improvements, human post-editing is still necessary in about 70% of cases. This is especially important for translating artistic, legal, and culturally rich texts, where context, style, and pragmatics remain essential.

Therefore, the growing role of artificial intelligence in translation and language technologies fits within the larger expansion of the digital linguistic ecosystem. Language technologies include systems of machine translation, text generation, speech recognition, and mood analysis – that thoroughly shape the modern communication services market.

Based on analytical data from the OECD and the European Linguistic Community, the global language technology market is experiencing steady growth in 2025, surpassing 40 billion U.S. dollars. Machine translation technologies hold the dominant position and are integrated into corporate, academic, and government communication systems.

For a visual overview of the market structure, see the pie chart below (Figure 1), which depicts the share distribution of the main segments of language technologies as of 2025.
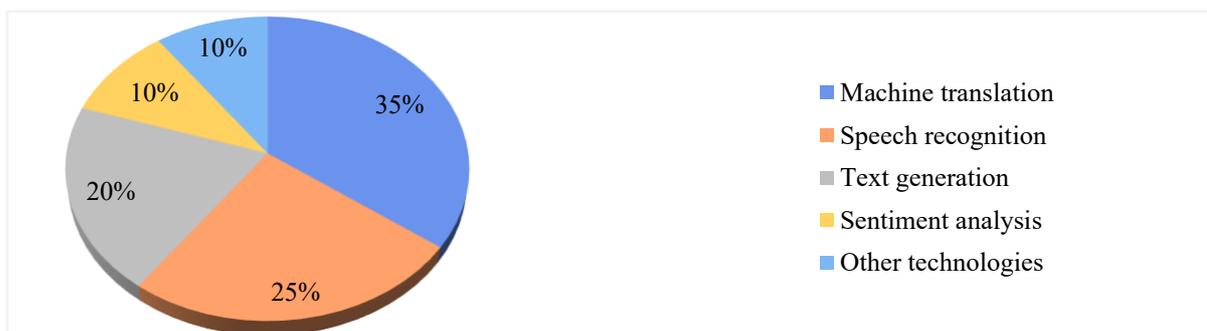
Figure 1. Distribution of the speech technology market according to ELIS (2025)

Source: created by the authors

As shown in the diagram in Figure 1, machine translation constitutes the largest market segment (about 35%), confirming its dominant role in transforming translation activities. The fast speed and easy access of these systems help automate communication in business, education, and media.

Speech recognition accounts for about 25% of the market and is increasingly used in human-machine interfaces, providing a user-friendly experience with digital devices.

Text generation, which accounts for about 20%, is becoming a vital tool in creating content, technical documentation, and training materials, especially with the rise of generative models like GPT, Claude, or Gemini.

At the same time, sentiment analysis and other language technologies (10% each) remain promising fields because they provide ethical and cognitive insights into communications.

Thus, the market structure shows a tendency toward balanced growth across translation, analytical, and generative technologies, which lays the groundwork for developing complex multimodal systems and enhances interaction between humans and artificial intelligence in translation studies.

Along with technological advances, the development of machine translation also has an economic dimension. According to Statista (2025), the global market for language technologies—which includes machine translation, automatic speech recognition, text generation, multilingual analytics, and voice assistants—is expected to be worth over $11.2 billion in 2025, nearly tripling the size of the market in 2020 (about $3.9 billion). Most of this market is dominated by widely used online services like Google Translate, DeepL, Microsoft Translator, and Amazon Translate, which support translation into more than 100 languages and process billions of requests daily.

At the same time, there is a rapid rise in highly specialized platforms focused on specific industries: legal (KantanMT), technical (SYSTRAN, Smartcat AI), medical (Unbabel Health), scientific, and academic (DeepL Pro Academic). These solutions are known for increased accuracy because they use domain-specific corpora tailored to each field's unique terminology and syntax.

Thus, from 2020 to 2025, machine translation will finally shift from being a supplementary linguistic technology to a core infrastructure service of the digital

economy. Its development is advancing not only through improvements in language models but also in the context of an ethical and methodological reevaluation of translation as a cognitive process that merges machine analysis, human intuition, and cultural awareness. The trends in the adoption of machine translation worldwide from 2020 to 2025 are shown in Table 1.

As shown in Table 1 and the earlier analysis, the European Union leads in incorporating machine translation into professional translation practices because of a structured approach to digital language policy. Notably, the implementation of the 2030 Language Equality initiative, managed by the European Commission, involves creating a multilingual digital infrastructure that guarantees equal capabilities for all 24 official EU languages. This strategy funds projects to develop open text corpora, machine learning platforms, and interoperable translation systems for the public sector. As a result, most European languages are already fully supported by leading neural translators such as DeepL, eTranslation, ModernMT, and OPUS-MT, offering fast and high-quality translation of official documents, technical manuals, and scientific texts.

Table 1. Dynamics of machine translation adoption in the world, 2020–2025 (% of total translation services)

Region	2020	2021	2022	2023	2024	2025	Note
EU	38%	45%	56%	64%	71%	78%	Active digitalization of the language services market
USA	42%	50%	63%	70%	75%	80%	High share of corporate translation platforms
Asia (Japan, South Korea, China)	36%	41%	52%	59%	65%	71%	Development of multilingual IT services and localization
Ukraine	18%	22%	30%	37%	43%	50%	Forecast: machine translation will exceed half of the market

Sources: generalized from Statista (n.d.), UNESCO (2023; 2025), ELIS (2024; 2025), OECD (2024a; 2024b).

Unlike Europe, the digitalization of the translation industry in the US is more market-driven and commercialized. Here, the main driving forces are large technology companies – Google, Microsoft, Amazon, Meta – which are developing their own ecosystems of artificial intelligence products and monetizing machine translation through cloud services. The primary focus is on enhancing the efficiency of algorithms based on large language models, such as GPT, Gemini, Claude, which provide translations that match the context and tone of the text. The US also leads in standardizing translation interfaces and data exchange formats, making it easier to integrate machine translation into enterprise solutions, multimedia content, and automated customer support systems.

In Asian countries, especially South Korea, Japan, and China, the development of machine translation mainly happens within corporate ecosystems—Samsung, Naver, Tencent, Huawei, Baidu—that create their own language models for internal use and

commercial products. A key feature of the Asian approach is the emphasis on multimodality and mobility, which involves integrating text, audio, video, and visual translation. These solutions are widely used in e-commerce, international education, and travel services.

Ukraine is gradually aligning with global trends by adopting artificial intelligence in education and research projects, advancing digital humanities studies, and supporting the digitalization of language policy. A key milestone was adding the Ukrainian language to the list of officially supported languages in Google Translate, DeepL, and Meta AI Translation, greatly expanding options for translating scientific papers, educational materials, and government documents. Moreover, in 2024, the National Standards Commission of Ukraine began developing a national protocol to ensure machine translation compatibility with European ELRC standards. The increase in machine translation's share of global translation work from 2020 to 2025 is illustrated in Figure 2.
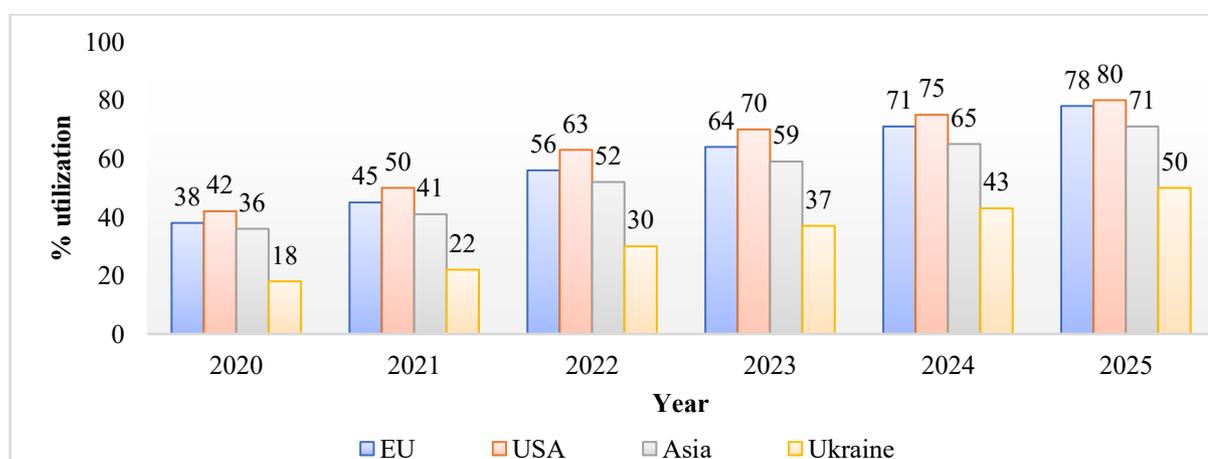

Figure 2. Dynamics of the share of machine translation in the total volume of translation work in the world (2020 – 2025) according to Machine Translation Market Report (2025)

Source: created by the authors

An analytical interpretation of the graph in Figure 2 shows that the European Union and the United States remain the clear leaders in machine translation adoption, with annual growth rates over 7%. In Asia, the pace of adoption is somewhat slower but steady, reflecting ongoing institutional support for local developers. Ukraine experiences accelerated growth after 2022, driven by the growing need for quick translation of informational materials, international cooperation documents, and scientific communications.

The results confirm that artificial intelligence's impact on the translation industry is seen in three main areas:

1. Optimization of the translation process – automatic pattern recognition, deadline coordination, and reducing project processing time. In 2024, the average translation speed

using neural network systems is 4000 to 6000 words per hour, which is 10 to 15 times faster than a human translator.

2. Improving the quality of linguistic corpora – modern artificial intelligence systems translate using contextual semantics and domain adaptation, which allows for a more accurate reflection of the text's stylistic features. The role of language engineers and linguistic analysts involved in creating training corpora and semantic models is growing.

3. Rethinking the role of the translator – according to UNESCO (2025), in the coming years, the profession of translator will evolve into a "language data manager" who combines the functions of translator, editor, and artificial intelligence analyst, responsible for the quality, accuracy, and cultural relevance of translation.

The key differences between traditional human translation and neural network-based machine translation are shown in Table 2. The comparison draws on data from the AI Policy Observatory (2024) and the ELIS (2024), which reflect both the technical and economic aspects of using artificial intelligence in translation.

Table 2. Key differences between traditional human translation and machine translation based on neural networks

Parameter	Human translation	Machine translation (neural networks)
Processing speed	300–500 words per hour	4000–6000 words per hour
Accuracy (without editing)	98–99%	85–90%
Cost (average, $ per 1000 words)	30–50	3–5
Preservation of style	High	Variable, depending on the system
Translation flexibility	High	Limited
Need for post-editing	Minimal	Mandatory
Scaling potential	Low	High

Source: AI Policy Observatory (2024) and ELIS (2024)

As Table 2 shows, machine translation has a clear advantage in speed and scalability, making it an effective tool for processing large volumes of text quickly. The characteristics of multinational companies, leaders, groups observing mixed agencies, working on a project, and the only work robots—art, legal documents, scientific papers, and various cultural works, even conceptually—are like a focus, showcasing the message, style, and metaphor of the text and the world. Still, much remains to be understood about how our brains handle this.

According to Rehm et al. (2024), the average accuracy of neural translation for an English-Ukrainian pair is about 88%, but it drops to 75–78% for low-resource languages or texts with complex terminology. Therefore, even with quick processing speeds, quality control and post-editing are still crucial steps.

From an economic point of view, the difference in translation costs is significant—machine translation costs 8 to 10 times less, leading to widespread use in publishing, corporate communications, and education (massive open online courses, MOOCs). However, the low cost is often offset by additional expenses for editing and review by specialists, which somewhat reduces the overall economic advantage.

Therefore, the study's results show that machine translation, enhanced by artificial intelligence technologies, is slowly changing not only the structure of the translation industry but also the way translation studies are understood as a science. There is a shift from the translator-text model to the translator-artificial intelligence-text model, where the interaction between humans and an intelligent system becomes the focal point.

On one hand, this opens new opportunities for global communication, multilingual access to knowledge, and the development of cognitive translation studies. On the other hand, it introduces new ethical, legal, and cultural challenges regarding the reliability of machine translations, the rights to the outputs of machine-created work, and the preservation of the author's style and cultural uniqueness of the text.

Over time, machine translation does not replace humans but reshapes their roles, transforming translators into linguistic data analysts, content editors, and interpreters of cross-linguistic semantics. This shift, in turn, requires updating translation studies programs and developing new skills, such as artificial intelligence literacy, analytics-based translation management, and human editing.

The rapid growth of language technologies, generative artificial intelligence, and automated translation systems is gradually reshaping the role of the translation profession. While once a translator was solely responsible for textual interpretation, now their role is shifting towards managing language data, post-editing, and analytics.

Figure 3 presents an infographic illustrating the transition from a traditional translator to a modern AI analyst.

As shown in the infographic in Figure 3, the professional development of a translator is gradually shifting from solely linguistic tasks to managing technological processes.
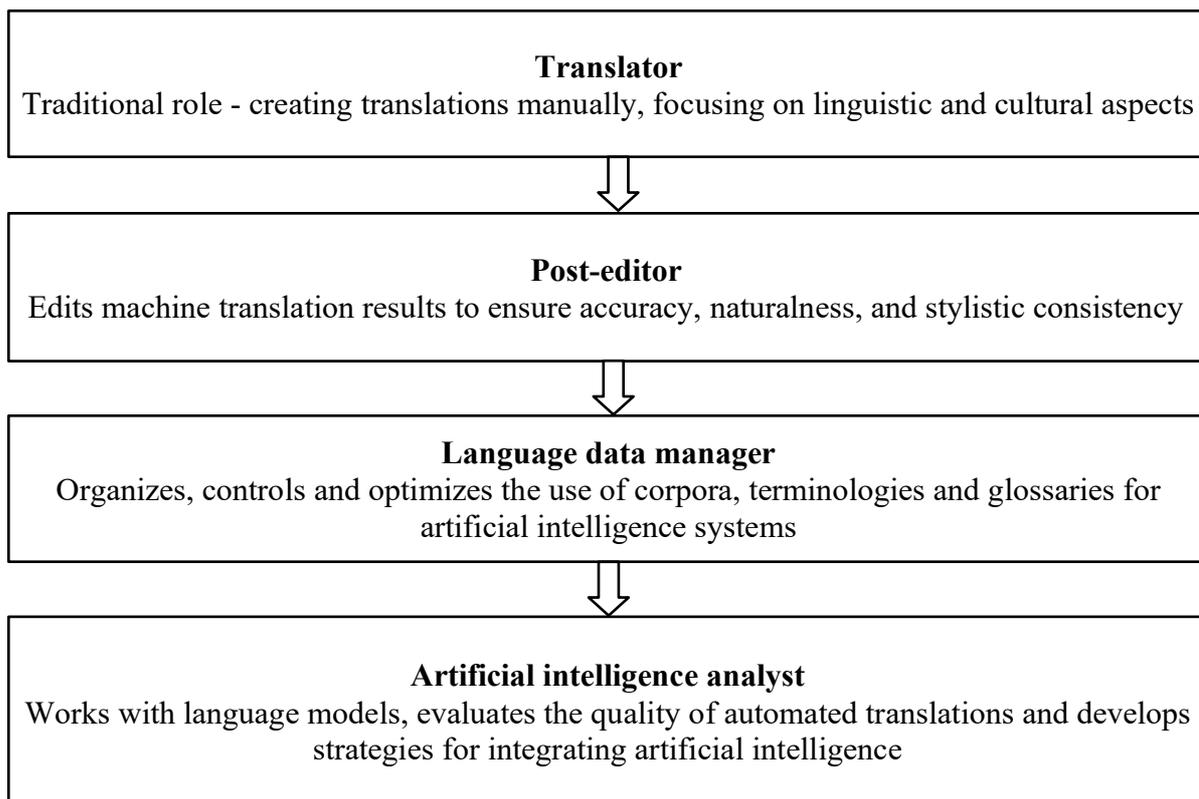
Translator Traditional role - creating translations manually, focusing on linguistic and cultural aspects

⇩

Post-editor Edits machine translation results to ensure accuracy, naturalness, and stylistic consistency

⇩

Language data manager Organizes, controls and optimizes the use of corpora, terminologies and glossaries for artificial intelligence systems

⇩

Artificial intelligence analyst Works with language models, evaluates the quality of automated translations and develops strategies for integrating artificial intelligence

Figure 3. Transformation of the role of a translator

Source: created by the authors

Translation work progresses with the growth of artificial intelligence. It's essential to maintain a balance between humans and machines to ensure that translations are not only precise but also distinctive and ethical. New technologies require modern skills from translators: digital literacy, understanding how computers operate, analyzing data, and thinking critically.

Now, the translator becomes not just an editor but also a language data analyst. The expert collaborates with artificial intelligence, adjusts its algorithms, and oversees communication quality. Humans and machines work together, blending humanitarian and technical fields. As a result, new careers emerge: linguistic analyst, content manager, and language engineer.

Research in this field opens up many new opportunities for science, especially in studying the relationship between artificial intelligence and translation studies. Given the trends of global digitalization, the following research areas seem promising.

1. Development of hybrid translation systems that combine machine algorithms with cognitive models of human thinking. Such systems can consider pragmatic, emotional, and cultural aspects of the text, thereby greatly enhancing the quality of automated translation.

2. Modeling the translator's cognitive processes in an artificial intelligence environment. This will help us better understand how a person makes translation decisions, chooses

strategies, and adapts content, thereby enabling us to develop smarter translator support systems.

3. Development of ethical and legal principles for using artificial intelligence in translation. The issues of authorship for machine-generated translations, algorithmic bias, and accountability for the content of translated materials require further research.

4. Develop national language corpora and Ukrainian-language translation models. To ensure the full integration of the Ukrainian language into the digital space, it is crucial to create open text corpora dedicated to training neural networks. This will support building an independent linguistic technology infrastructure in Ukraine.

4. Adapting translation studies programs to meet the needs of artificial intelligence. It is recommended to add courses in machine learning, digital linguistics, and critical text analysis to prepare a new generation of translators.

5. Study the impact of generative models of artificial intelligence on intercultural communication, interlingual semantics, and translation ethics. The analysis of how artificial intelligence influences new forms of textual interaction between cultures is particularly promising.

Therefore, the future of translation studies will rely on science's ability to integrate technological innovations with humanitarian values. Going forward, it is crucial to develop a balanced understanding of coexistence between human and artificial intelligence in the translation process. This will help not only to increase translation efficiency but also to preserve cultural uniqueness and uphold the ethical responsibilities of translators.

5. DISCUSSION

Artificial intelligence technologies are rapidly changing translation. They create new opportunities but also introduce challenges for translators. Research shows that machine translation, especially neural network-based, has become quick and accurate enough. However, AI still can't fully imitate how a person conveys style, culture, and tone.

Limits of machine translation capabilities — discussion questions. ChatGPT, DeepL, and Google Translate better understand context. However, they lack human intuitive thinking and a sense of beauty. Therefore, AI is a tool, not a true participant in translation.

The role of the translator is also changing. Some researchers say the translator is becoming more like an editor and analyst who oversees the collaboration between people and machines. Others warn that this change could lessen the value of translation work, turn it into templates, and lead to the loss of the author's style. It is vital to build an ethical culture that respects authorship, takes responsibility, and ensures quality control.

Another important point concerns law and ethics. If AI is used for translation, the author's rights should be clearly defined, especially when the text is created by both humans and machines. The new European law, the Artificial Intelligence Act, states that the user, not the program, is responsible for machine-generated text (European Commission, 2024). Therefore, new rules are needed for translators' work in the digital age.

The cultural aspect is also very important. AI models are trained on English texts, which can cause biases in other languages and imitate external cultural norms. It is crucial for

Ukrainian translators to create their own language corpus to preserve and promote their national culture.

So, the translation field in AI isn't just a technique; it's also a philosophy. Humans and machines must collaborate to combine accuracy and creativity. Future research should emphasize cooperative models where AI supports, but the individual remains the main bearer of culture and meaning.

6. CONCLUSIONS

The study shows that artificial intelligence is becoming a key part of transforming modern translation studies, impacting all aspects of translation work. The shift from rule-based to neural and generative machine translation models has opened up opportunities to integrate technology into professional translation practices, enabling more automation and process improvements. However, the analysis indicates that, despite using advanced technology, artificial intelligence systems still face limitations in understanding the cognitive, pragmatic, and cultural dimensions of translation. The human element remains crucial for ensuring semantic accuracy, emotional nuance, and ethical standards in translation tasks. Therefore, the current approach to translation is increasingly adopting a collaborative model, where translators act as analysts, editors, and mediators between algorithms and cultural contexts.

Special attention should be given to issues such as legal regulation, ethical standards, and linguistic and cultural balance when using artificial intelligence. The absence of clear copyright policies, algorithmic biases, and the lack of standardization in language structures create risks to the professional independence of translators and to the preservation of national language identity. It is strategically important for Ukraine to develop its own language corpora, Ukrainian-language translation models, and educational programs that combine linguistic and technological training.

Thus, the main outcome of the current stage in translation studies is the development of a new integration paradigm where artificial intelligence is seen not as a competitor but as a partner to humans. Future research should focus on creating a cognitive humanistic approach to translation that balances technological efficiency with the preservation of cultural authenticity, creativity, and ethical principles in the digital age.

References

AI Policy Observatory 2024. *OECD*. https://oecd.ai/

Chen, Shan, and Yanhong Liu. 2023. Identity formation and transformation of Chinese university translator trainers. *The Interpreter and Translator Trainer* 17(3), 353–374. https://doi.org/10.1080/1750399X.2023.2237325

ELIS. 2024. *European Language Industry Survey 2024: Trends, expectations and concerns of the European language industry*. https://elis-survey.org/wp-content/uploads/2024/03/ELIS-2024-Report.pdf

ELIS. 2025. *European Language Industry Survey 2025: Trends, expectations and concerns of the European language industry*. https://elis-survey.org/wp-content/uploads/2025/03/ELIS-2025_Report.pdf

European Commission. 2024. *Artificial Intelligence Act: Harmonised rules on AI*. https://artificialintelligenceact.eu/

European Commission`s European Master's in Translation. n. d. *Directorate-General for Translation.* https://ec.europa.eu/info/resources-partners/european-masters-translation-emt_en

Global Industry Analysts. n. d. *Market research reports & forecasts.* https://www.strategyr.com

Grand View Research. 2023. *Language services market size, share & trends analysis report, 2023–2030.* https://www.grandviewresearch.com/industry-analysis/language-services-market-report

Guerberof-Arenas, Ana, and Antonio Toral. 2022. Creativity in translation: Machine translation as a constraint for literary texts. *Translation Spaces* 11(2), 184–212. https://doi.org/10.1075/ts.21025.gue

IndustryARC. 2025. *Machine translation market – Forecast (2025–2031).* https://www.industryarc.com/Research/Machine-Translation-Market-Research-504145

Kravets, Larysa, Galyna Siuta, Tetiana Semashko and Nadiia Bobukh. 2023. Cognitive-assessment content of zoomorphic metaphors in contemporary Ukrainian and English language culture: A comparative aspect. *World Journal of English Language* 13(6), 439–448. https://doi.org/10.5430/wjel.v13n6p439

Kravets, Larysa, Natalie Venzhynovych, Bolin Zhang, Ivan Poliuzhyn and Renata Lukanynets. 2025. Dynamics of language systems in the era of digitalization. *Testing, Psychometrics, Methodology in Applied Psychology, 32*(S1), 170–180. https://tpmap.org/submission/index.php/tpm/article/view/142

Kravets, Larysa, and Tetiana Semashko. 2024. Semantic innovations in contemporary media discourse. *Dragoman International Journal of Translation Studies* 14(16), 244–268. https://bit.ly/47zxUVf

Lambert, Joseph, and Callum Walker. 2022. Because we're worth it: Disentangling freelance translation, status, and rate-setting in the United Kingdom. *Translation Spaces* 11(2), 277–302. https://doi.org/10.1075/ts.21030.lam

Li, Ruichao, Abdullah Mohd Nawi and Myoung Sook Kang. 2023. Human-machine translation model evaluation based on artificial intelligence translation. *EMITTER International Journal of Engineering Technology* 11(2), 145–159. https://doi.org/10.24003/emitter.v11i2.812

Lund, Kristine. 2022. Modelling the co-elaboration of knowledge: Connecting cognitive, linguistic, social and interactional systems. In K. Lund, P. Basso Fossali, A. Mazur, M. Ollagnier-Beldame (Eds.) *Language is a complex adaptive system: Explorations and evidence* (pp. 35–48). Berlin: Language Science Press. https://doi.org/10.5281/zenodo.6620111

Mialkovska, Liudmyla, Volodymyr Hrysiuk, Liudmyla Zhvania, Tamara Nykoliuk, Larysa Tykha, Larysa Sadova and Maksym Yablonskyy. 2024. Leveraging media and public relations strategies to advance sustainable development: Approaches, frameworks, and tactics in modern conditions. *Grassroots Journal of Natural Resources* 7(3), 253–269. https://doi.org/10.33002/nr2581.6853.0703ukr13

Mialkovska, Liudmyla, Oksana Maiboroda, Nataliia Koretska, Yaroslava Martyniuk, Olena Haponchuk and Liudmyla Korobchuk. 2025. Modern approaches to educational management: European perspectives on innovation. *Salud, Ciencia y Tecnología – Serie de Conferencias* 4. https://doi.org/10.56294/sctconf20251479

Mondal, Subrota Kumar, Haoxi Zhang, H. M. Dipu Kabir, Kan Ni and Hong-Ning Dai. 2023. Machine translation and its evaluation: a study. *Artificial Intelligence Review* 56(9), 10137–10226. https://doi.org/10.1007/s10462-023-10423-5

205

Moorkens, Joss. 2022. Ethics and machine translation. In D. Kenny (Ed.) *Machine translation for everyone: Empowering users in the age of artificial intelligence,* 121–140. Berlin: Language Science Press. https://doi.org/10.5281/zenodo.6759984

OECD. 2024a. *OECD Digital Economy Outlook 2024 (Volume 1): Embracing the technology frontier*. Paris: OECD Publishing. https://doi.org/10.1787/a1689dc5-en

OECD. 2024b. *OECD Digital Economy Outlook 2024 (Volume 2): Strengthening connectivity, innovation and trust*. Paris: OECD Publishing. https://doi.org/10.1787/3adf705b-en

Pollock, Sarah. 2025. Ethics of care and linguistic diversity: Towards an ethics of communication in social work practice? *Ethics and Social Welfare*, 1–20. https://doi.org/10.1080/17496535.2025.2509980

Rehm, Georg, Stelios Piperidis, Khalid Choukri, Andrejs Vasiļjevs, Katrin Marheinecke, Victoria Arranz, et al. 2024. Common European Language Data Space. In *Proceedings of the 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation,* 3579–3586. Torino: ELRA and ICCL. https://aclanthology.org/2024.lrec-main.317

Rivera-Trigueros, Irene. 2022. Machine translation systems and quality assessment: A systematic review. *Language Resources and Evaluation* 56(2), 593–619. https://doi.org/10.1007/s10579-021-09537-5

Sela-Sheffy, Rakefet. 2023. What does it take to be a professional translator? Identity as a resource. In Glückler, J., Winch, C., Punstein, A.M. (Eds.) *Professions and proficiency* (pp. 89–111). Cham: Springer. https://doi.org/10.1007/978-3-031-24910-5_5

Signorini, Ines. 2024. Reviewing and rebuilding objects of inquiry. *Journal of Sociolinguistics* 28(5), 49–51. https://doi.org/10.1111/josl.12686

Singer, Nestor. 2022. How committed are you to becoming a translator? Defining translator identity statuses. *The Interpreter and Translator Trainer* 16(2), 141–157. https://doi.org/10.1080/1750399X.2021.1968158

Sodiqova, Nargiza. 2025. Scientific and theoretical foundations of literary translation transformations. *International Journal of Artificial Intelligence* 1(2), 368–371. https://inlibrary.uz/index.php/ijai/article/view/73989

Statista. n. d. *Statistics and facts across 170 industries and 150+ countries*. https://www.statista.com

Tavares, Célia, Laura Tallone, Luciana Oliveira and Sandra Ribeiro. 2023. The challenges of teaching and assessing technical translation in an era of neural machine translation. *Education Sciences* 13(6), 541. https://doi.org/10.3390/educsci13060541

Tesseur, Wine, Sharon O'Brien and Enida Friel. 2022. Language diversity and inclusion in humanitarian organisations: Mapping an NGO's language capacity and identifying linguistic challenges and solutions. *Linguistica Antverpiensia, New Series–Themes in Translation Studies,* 21. https://doi.org/10.52034/lanstts.v21i.733

Translation Centre. 2025. *Consolidated annual activity report of the translation centre 2024*. https://doi.org/10.2817/0817847

UNESCO. 2023. *Recommendation on the ethics of artificial intelligence: Implementation progress report*. https://unesco.org.uk/site/assets/files/14137/unesco_recommendation_on_the_ethics_of_artificial_intelligence_-_key_facts.pdf

UNESCO. 2025. *Artificial intelligence and culture: Report of the Independent Expert Group on AI and Culture*. https://lnkd.in/gv2KiMVn

Xu, Jun, and Qingran Wang. 2025. Applying neural machine translation and ChatGPT in the teaching of business English writing. *Translation and Translanguaging in Multilingual Contexts* 11(1), 88–110. https://doi.org/10.1075/ttmc.00155.xu