

MACHINE TRANSLATION AND COMPUTER-ASSISTED TRANSLATION: FUNCTIONAL DIFFERENCES, APPLICATIONS, AND THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE TRANSLATION PROFESSION

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Annotatsiya (o'zbek tilida): Ushbu maqola Mashina Tarjimasi (MT) va Kompyuter Yordamida Tarjima (CAT) ni solishtiruvchi tahlilni taqdim etadi, ularning rivojlanishi, ish jarayoni farqlari va zamonaviy tarjima muhitidagi qo'llanilishiga e'tibor qaratadi. Bundan tashqari, Sun'iy Intellekt (AI) ning tarjima kasbiga ta'sirini o'rganadi, potentsial xavflar va imkoniyatlarni ta'kidlaydi. Natijalar shuni ko'rsatadi, AI boshqaruvidagi MT tarjima tezligi va mavjudligini sezilarli darajada yaxshilagan bo'lsa-da, tarjimonlar bandligi bo'yicha, ayniqsa boshlang'ich mutaxassislar orasida xavotirlarni keltirib chiqarmoqda. Biroq, dalillar shuni ko'rsatadi, inson omili madaniy, kontekstual va stilistik aniqlikni ta'minlashda muhim rolni saqlab qolmoqda. Tadqiqot xulosasi shuki, gibrildi inson-AI ish jarayonlari kelajakdagi tarjima amaliyotlari uchun eng samarali modelni ifodalaydi.

Tayanch iboralar: mashina tarjimasi (MT), kompyuter yordamida tarjima (CAT), CAT vositalari, sun'iy intellekt, tarjima texnologiyalari, inson omili, tarjimon roli, mehnat bozori.

Аннотация (на русском языке): В этой статье представлен сравнительный анализ машинного перевода (MT) и компьютерно-ассистированного перевода (CAT), с акцентом на их развитие, различия в рабочих процессах и применение в современных условиях перевода. Кроме того, исследуется влияние искусственного интеллекта (AI) на профессию

переводчика, подчеркивая потенциальные риски и возможности. Результаты показывают, что хотя МТ на базе AI значительно улучшил скорость и доступность перевода, он также вызвал обеспокоенность по поводу занятости переводчиков, особенно среди специалистов начального уровня. Однако доказательства предполагают, что человеческие переводчики сохраняют ключевую роль в обеспечении культурной, контекстной и стилистической точности. Исследование заключает, что гибридные рабочие процессы человек–ИИ представляют наиболее эффективную модель для будущих практик перевода.

Ключевые слова: машинный перевод (MT), компьютерно-ассистированный перевод (CAT), CAT-инструменты, искусственный интеллект, технологии перевода, человеческий фактор, роль переводчика, рынок труда.

Abstract (in English): This article provides a comparative analysis of Machine Translation (MT) and Computer-Assisted Translation (CAT), focusing on their development, workflow differences, and applications in modern translation environments. It further examines the impact of Artificial Intelligence (AI) on the translation profession, highlighting potential risks and opportunities. Findings show that while AI-driven MT has significantly improved translation speed and accessibility, it has also raised concerns regarding translator employment, especially among entry-level professionals. However, evidence suggests that human translators retain an essential role in ensuring cultural, contextual, and stylistic accuracy. The study concludes that hybrid human–AI workflows represent the most effective model for future translation practices.

Keywords: machine translation (MT), computer-assisted translation (CAT), CAT tools, artificial intelligence, translation technologies, human factor, translator's role, labor market.

Introduction. The rapid rise of AI technologies has reshaped the translation industry, making translation faster and more accessible than ever before. MT systems can now generate real-time, context-aware translations at extremely low cost, while CAT tools continue to support professional translators in producing high-quality and consistent output. The combination of MT and CAT has become a dominant workflow across the language industry. This article analyzes the functional differences between MT and CAT, their technological evolution, and their respective roles in modern translation. It also examines the broader impact of AI on translator employment, workload, and professional identity [1, 1]. Machine Translation (MT) MT refers to fully automated translation performed by software systems without human intervention. Modern MT has evolved from rule-based models in the 1950s to statistical systems in the 1990s and, more recently, to Neural Machine Translation (NMT), which significantly improved fluency and contextual accuracy [6, 1]. With advancements in Large Language Models (LLMs), MT has reached new heights, providing more natural and context-sensitive translations.

A major advantage of MT is its capability to handle extensive amounts of text quickly and affordably. MT is currently extensively utilized in e-commerce localization, instant communication, multimodal translation, and large-scale content distribution [1, 1]. Nonetheless, MT continues to face challenges with idiomatic phrases, cultural references, low-resource languages, and areas needing exact terminology.

Translation Assisted by Computers (CAT). CAT tools assist human translators by offering Translation Memory (TM), terminological management, alignment tools, segmentation, and quality control functionalities. CAT tools surfaced in the 1980s and gained popularity in the 2000s through platforms like SDL Trados and MemoQ [2, 13]. In contrast to MT, CAT tools support human translators without substituting them, boosting productivity, consistency, and quality. TM can lower the workload by as

much as 60% in repetitive content, and termbases maintain terminological precision throughout extensive projects. Modern CAT tools are progressively incorporating AI functionalities, such as adaptive MT recommendations, real-time quality assessments, and automated terminology extraction [8, 1]. This hybridization further obscures the distinction between MT and CAT. Comparative Study of MT and CAT Process and Operations MT involves completely automated handling, whereas CAT allows the translator to maintain control. MT offers unparalleled speed, while CAT ensures superior quality with human supervision. MT is ideal for high-volume or low-stakes content, while CAT is favored in legal, medical, and technical translations, where precision and consistency are vital [5, 13].

Precision and Dependability

The quality of machine translation depends on the language combination and the specific field. Conversely, CAT tools provide consistency and high-quality accuracy, particularly when translators utilize well-managed TMs and glossaries. Research indicates that human translators reliably surpass machine translation in terms of nuance, pragmatic significance, and culturally aware content [3, 55]. Utilizations and New Developments Uses of Machine Translation E-commerce adaptation to local markets Automation of customer support Instantaneous chat and meeting translation Extensive content distribution Trilingual translation (audio–text–visual) In spite of these advantages, MT encounters challenges in intricate fields like legal and medical translation, where mistakes can lead to significant repercussions. Uses of Computer-Assisted Translation Legal and healthcare documents Instructional guides Translation of academic research Documents related to government and policy Texts driven by standardized terminology CAT tools offer a well-rounded blend of human expertise and technological support. Influence of AI on the Translation Industry AI has greatly influenced the translation job market. A 2025 industry report shows that more than 76,000 jobs related to linguistics have been eliminated because of automation [7, 33]. Around 75% of translators express worries about declining income, particularly among

freelance workers and those at the beginning of their careers. Moreover, 66% of businesses now prefer MT post-editing (MTPE) instead of conventional translation, decreasing the need for human-only translation [4, 33]. New positions have arisen, such as MTPE specialists, AI localization managers, and linguistic data curators. These positions necessitate that translators comprehend AI systems, assess MT results, and manage linguistic datasets. Debate: Human vs AI Functions Even with AI progress, human translators continue to be crucial. Humans are skilled at understanding nuance, emotional tone, cultural significance, humor, irony, and brand voice—domains where MT frequently struggles. Ethical concerns necessitate human supervision, particularly when dealing with sensitive or confidential content [9, 12]. Hybrid workflows that merge the speed of MT with human skill offer the best approach for balancing quality and efficiency. This method is expected to lead the industry until 2030.

Suggestions. Translators ought to cultivate MTPE (Machine Translation Post-Editing) abilities. Understanding CAT tools and AI-enhanced processes is crucial. Expertise in areas like law, Employment stability is enhanced by fields such as medicine or finance. It is advisable to engage in ongoing education regarding AI ethics and data privacy. Cooperation between government officials and industry executives is essential to facilitate translator retraining initiatives. Final thoughts MT and CAT both have vital functions in today's translation sector. MT delivers unparalleled speed and cost-effectiveness, whereas CAT tools ensure quality, uniformity, and human supervision. AI has revolutionized the translation field, generating both chances and challenges for specialists. Although automation can diminish specific kinds of translation tasks, human translators still offer unmatched worth in aspects that demand nuance, cultural awareness, and ethical considerations. The future of translation depends on a combination of human and AI teamwork.

References

Acolad. (2025). Machine translation applications and industry use cases. Acolad Research.

Bowker, L. (2015). Computer-aided translation technology. Routledge.

Bridger, E. (2024). MT vs human translation: Comparative accuracy study. *Global Linguistics Journal*, 12(2), 55–78.

Hannah, R. (2025). AI and labor shifts in the translation industry. *Language Tech Review*, 18(1), 33–49.

Hicom Asia. (2025). CAT tools and modern workflows. Hicom Whitepaper.

Hutchins, J. (2010). The history of machine translation. John Benjamins.

LT Insights. (2025). Automation and job displacement in language services. LT Global Reports.

MemoQ. (2024). AI integration in modern CAT tools. MemoQ Systems Whitepaper.

Silvers, J. (2025). Ethical challenges in AI-driven translation. *Journal of Language Technology and Ethics*, 7(1), 12–28..