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Reconceptualising Language Services in the Age of Artificial Intelligence: Balancing Technological Efficiency with Human Expertise

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ABSTRACT

This position paper argues that sustainable progress in the language service industry depends on harmonising artificial intelligence with human expertise rather than replacing human practitioners. It begins by tracing the evolution of language services from traditional human translation to artificial intelligence (AI)-assisted workflows, emphasising that while technology enhances speed and accessibility, it often compromises cultural and contextual accuracy. The paper examines the strengths and limitations of AI, showing that machine translation and automated localisation perform efficiently in structured tasks but struggle with idiomatic, context-sensitive, and emotionally charged language. Human expertise remains indispensable, providing linguistic intuition, cultural competence, and ethical responsibility that ensure accountability, interpretive depth, and communicative authenticity. A synergistic model of collaboration is proposed, in which AI supports human translators through hybrid workflows, post-editing, and ethical guidelines, thereby enhancing productivity without sacrificing quality. The discussion extends to policy, education, and professional implications, advocating for curriculum reform, digital literacy, ethical training, and institutional regulations that preserve professional standards and protect human roles in AI-mediated environments. Throughout, the paper is grounded in the socio-technical systems framework, which emphasises that optimal performance arises from the integration of social and technical subsystems. The analysis reveals the need for ongoing research, policy engagement, and professional oversight to build a balanced, human-centred approach to technological innovation, ensuring that language services continue to deliver culturally appropriate, ethical, and accurate communication.

Keywords: Language Services; Artificial Intelligence; Human Expertise; Socio-Technical Systems; Professional Standards

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1. Introduction

Language services have become an indispensable component of global communication, particularly in an era characterised by rapid digital transformation and technological advancement. Globalisation has significantly expanded the demand for translation, interpreting, and localisation services, thereby compelling the industry to adapt to the dynamics of digital markets and transnational communication [1]. The emergence of artificial intelligence (AI) has accelerated this transformation, introducing neural machine translation (NMT), speech recognition, and automated localisation tools that promise speed and cost-effectiveness. Technology has made it possible for language service providers to process vast volumes of multilingual content in record time, thus reshaping the very structure of linguistic mediation [2]. However, while such automation enhances operational efficiency, it also raises critical questions about the preservation of linguistic authenticity, contextual accuracy, and cultural appropriateness. Human translators and interpreters, unlike algorithms, are attuned to social contexts, idiomatic expressions, and pragmatic subtleties that determine communicative success. The increasing reliance on AI risks reducing translation to a mechanical exercise that neglects these essential human dimensions [3]. Therefore, this paper argues that although AI has revolutionised the language service industry by enhancing speed and accessibility, sustaining quality, cultural sensitivity, and professional integrity demands a deliberate balance between technological innovation and human expertise.

Transitioning from this premise, Socio-technical Systems Theory provides a valuable perspective for understanding how such a balance may be achieved. This theory posits that the effectiveness of any organisation or industry depends on the integration of its social and technical components [4]. In the context of language services, the social subsystem comprises human translators, interpreters, and editors, while the technical subsystem includes AI-driven translation tools and digital infrastructures. The neglect of either component undermines systemic harmony, producing inefficiencies and errors that compromise overall quality [5, 6]. Applying this theoretical framework to the contemporary language service industry reveals a structural imbalance: technology is often prioritised for its productivity benefits, while human expertise is undervalued or relegated to post-editing functions. This overemphasis on automation reduces human practitioners to quality controllers rather than active agents of meaning-making [7]. The challenge, therefore, lies not in resisting technology but in reconfiguring professional practice and institutional policy to foster a complementary relationship between human and machine.

Furthermore, the integration of AI into language services has generated intense debate concerning the quality and reliability of automated translations. Neural machine translation systems have achieved remarkable progress in terms of fluency and speed; yet, they continue to exhibit weaknesses in handling polysemy, cultural metaphors, and pragmatic intent [8]. These deficiencies stem from the fact that AI systems operate through pattern recognition rather than genuine comprehension of meaning. In contrast, human translators interpret communicative intent through contextual inference, a process known as essential to maintaining functional equivalence across languages [9]. Therefore, while AI contributes to efficiency, it cannot independently ensure semantic accuracy or cultural appropriateness. The Socio-technical perspective reinforces this view by suggesting that technological success in translation must be evaluated not only through computational metrics but also through the social processes of meaning negotiation that human translators enact. Consequently, the balance between human and technological input should not be treated as a technical adjustment but as an ethical and professional obligation.

In addition, critical scholarship has begun to question the socio-economic and professional implications of AI's growing dominance in the language industry. Machine translation has redefined labour structures, often leading to the deskilling and devaluation of professional translators. This transformation reflects the "technologisation" of translation, wherein human agency is marginalised in favour of efficiency metrics dictated by corporate clients and software developers [10]. Such developments raise ethical concerns about authorship, accountability, and intellectual labour, which remain central to humanistic understandings of translation. From a Socio-technical Systems perspective, these concerns illustrate the dangers of overemphasising technical optimisation without equivalent attention to social welfare and professional integrity. Sustainable innovation in language services depends on valuing human translators not merely as cor-

rectors of machine output but as co-creators of meaning[11]. Hence, the integration of AI must be guided by principles that preserve human creativity and interpretive authority within the translation process.

Therefore, the contemporary transformation of language services necessitates a redefinition of professional boundaries and technological practices. The challenge for researchers, educators, and practitioners is to conceptualise a model in which AI serves as an augmentative tool rather than a replacement for human expertise. Translator education should focus on developing hybrid competencies that combine linguistic acumen with technological literacy[12]. Such training aligns with the Socio-technical Systems Theory, which advocates designing systems that empower workers through participatory engagement with technology. This balanced approach can ensure that innovation in language services advances both operational efficiency and communicative authenticity. Thus, sustaining excellence in the era of AI requires recognising that language is not merely a technical code to be processed but a social act embedded in human experience. As this paper maintains, the future of the language service industry depends on harmonising technological capability with human interpretive insight, ensuring that efficiency never eclipses understanding.

2. The Evolution of Language Services in the Technological Age

The evolution of language services shows the connection between linguistic practice, technology, and global demand. Translation and interpreting were originally human processes that relied on language skills and cultural understanding[13]. Early translation practices, such as monastic copying of texts or colonial language mediation, depended on judgment and context. The industrial and digital revolutions, however, changed this approach and made language work more of a commodity. The introduction of computer-assisted translation (CAT) tools in the late twentieth century shifted translation from fully manual work to semi-automated systems[14]. This change was driven by the need for faster work, consistent output, and lower costs in multilingual communication. While technology improved workflow and terminology management, it also changed the translator's role from cultural mediator to technical operator. This shift created a tension between creative language use and standardised procedures, a tension that continues in discussions about the role of humans in translation today.

The twenty-first century brought rapid digital transformation and globalisation, increasing the demand for multilingual content. International markets, social media, and global organisations expanded language services beyond traditional translation to include localisation, transcreation, and digital interpreting[15]. Language services became essential in business and diplomacy, but dependence on technology also increased. Neural machine translation (NMT), based on artificial intelligence, became central to this change. NMT uses deep learning with large bilingual datasets to create fluent, grammatically correct translations[16]. Major tech companies have invested in these systems and integrated them into interpreting and communication platforms. These developments shift the focus from human skills to data-driven processes. Despite their speed and scale, AI systems are limited to algorithmic output and cannot fully understand language, a limitation that sparks ongoing debate among scholars and professionals.

Even with these technologies, questions remain about whether automation serves the purposes of translation. AI improves productivity and cuts costs but often sacrifices cultural accuracy and style[17]. Machine translation focuses on computational accuracy but struggles with meaning, including irony, politeness, and idioms. Good translation involves more than matching words; it preserves the intended meaning across cultures. When systems rely only on statistics or neural computation, they may produce literal translations that distort meaning. This trend shows that efficiency has become the main measure of quality, while ethical and cultural factors are often ignored. The key question is not if machines can translate, but whether their work meets the communicative and cultural needs of human interaction.

Socio-technical Systems Theory helps explain the gap between human and technological components. Effective systems need both technical and social parts, as neglecting either leads to poor results[18]. Applied to translation, this means technology cannot replace human judgment, ethics, and communication skills. Focusing on technology without supporting human expertise can cause errors, loss of meaning, and ethical problems. In translation, this can appear as mistakes that harm diplomacy, misrepresent legal documents,

or mislead marketing messages. The socio-technical view stresses that technology and humans must work together. This challenges the idea that automation can fully handle translation, and supports the need for human supervision and reasoning.

The history of language services, from human translation to AI-assisted systems, shows progress and challenges. Digital translation, automated localisation, and global communication tools have improved access and efficiency. These gains, however, come with the risk of reducing language to data and weakening cultural understanding. The future depends on combining human skill with computational tools. This requires new ethics, better training for translators, and policies that ensure quality. The socio-technical view shows that progress is possible only when technology supports human decision-making. The evolution of language services in the digital age is not a simple move toward machines, but an ongoing effort to balance human understanding with artificial intelligence, determining the future value of translation as both work and practice.

3. The Strengths and Limitations of AI in Language Service Delivery

Artificial intelligence has expanded the reach and efficiency of language services. Neural machine translation (NMT) systems now surpass earlier statistical and rule-based models, producing translations close to human fluency in high-resource languages[19, 20]. These systems use deep learning algorithms that process large multilingual datasets, allowing translations to occur quickly across many fields. AI-driven translation tools reduce costs for translation agencies, enabling smaller businesses and individuals to access services previously restricted to large institutions. AI also improves interpreting through real-time speech recognition and automatic subtitling, supporting communication in virtual meetings. Recent large language models (LLMs) further enhance AI's ability to handle context, paraphrasing, and basic reasoning, creating more coherent outputs than earlier systems[21]. While these advances improve access and speed, concerns remain about whether AI alone can achieve the cultural, pragmatic, and ethical standards of professional translation.

Despite these technical improvements, AI remains limited in processing meaning beyond the literal level. Translation is not only word conversion but a communicative act requiring awareness of context, tone, and cultural cues[22]. Machine outputs are grammatically coherent yet often fail in functional equivalence, especially in legal, literary, and diplomatic texts where precision is critical. Even with LLMs, AI can struggle with irony, humour, and audience-specific interpretations, although recent models have reduced some errors in context handling. Translation involves negotiation within social and cultural settings, an ability machines cannot fully replicate. This suggests that while AI can generate fluent text, human expertise remains essential for interpretive accuracy and culturally appropriate decision-making.

AI also shows limitations in emotional sensitivity and stylistic judgment. Tone and emotion shape the persuasive or expressive power of language, which is central to advertising, diplomacy, and literature[23]. Stylistic choices depend on audience, purpose, and context—factors beyond the intuitive grasp of current AI systems. Idiomatic expressions often receive literal translations, confusing target readers. These examples illustrate where human insight is required to preserve relational and affective meaning. LLMs and contextual models can improve some stylistic and pragmatic elements, yet they do not consistently replace the human ability to interpret subtleties in tone, humour, or social appropriateness.

Structured and repetitive tasks remain a strong domain for AI. Technical manuals, weather reports, and administrative correspondence benefit from AI's speed and consistency[24]. Hybrid workflows combining machine translation and human post-editing increase productivity without compromising quality[25]. Socio-technical systems theory provides a framework to analyse these workflows in detail. It shows how professional roles, task design, and institutional rules interact with technology. For instance, assigning humans to post-editing allows machines to handle predictable content while translators focus on interpretation, style, and cultural relevance. Such division improves efficiency while maintaining professional standards. Imbalance between technical and social elements can reduce translation to mechanical processing. The theory thus helps guide institutional practices, workflow design, and role definitions rather than simply justifying human involvement.

Ethical considerations in AI-mediated translation can be divided into professional, socio-economic, and moral-

philosophical dimensions. Professionally, reliance on AI can erode accountability and devalue human skill if translators become mere editors [25]. Socio-economically, cost reduction and automation can shift market power to technology owners, affecting employment and equitable access. Morally, AI-generated translations may misrepresent authors' intentions or cultural content if unchecked, raising issues of responsibility and trust [25]. A conceptual visual model can represent this socio-technical network of human roles, tasks, and AI functions, but it should be seen as illustrative rather than prescriptive. Documented practices show that successful language service providers maintain clear ethical standards, combining AI efficiency with human oversight, continuous training, and review processes.

A balanced assessment recognises that AI has both strengths and limits. Efficiency, scale, and rapid output are undeniable advantages. Recent large language models (LLMs) and contextual models provide more coherent and context-aware translations than previous generations. Counterarguments note that AI can support creativity, collaborative translation, and adaptive content generation, reducing repetitive cognitive load for humans [26]. However, human translators remain indispensable for interpretive accuracy, cultural sensitivity, and ethical responsibility. Hybrid approaches integrating human judgment with machine capability offer the most reliable path forward. Socio-technical analysis shows that progress depends not solely on technology but on well-designed workflows, clearly defined professional roles, and institutional policies that safeguard meaning, style, and ethical integrity. AI should thus enhance human expertise rather than replace it, ensuring language services remain effective, responsible, and culturally grounded.

4. The Indispensability of Human Expertise

Human expertise in language service delivery remains essential because linguistic intuition, cultural awareness, and ethical responsibility cannot be fully replicated by artificial intelligence. Translation involves more than word substitution; it requires decision-making based on context, communicative intent, and moral judgment. Human translators perceive social cues and use pragmatic inference to adapt expressions appropriately. This interpretive ability stems from accumulated experience and professional accountability, which are especially critical in high-stakes domains such as diplomacy, law, and religion. Recent advances in large language models (LLMs) have improved AI's handling of context and coherence, yet human expertise continues to provide interpretive judgment, cultural calibration, and moral oversight that machines cannot emulate [27]. Technology cannot fully assume the translator's role as mediator of values and embedded ideologies. Therefore, human skill is not measured by speed but by the capacity to safeguard socially and ethically grounded meaning.

Professional practice confirms that human oversight remains indispensable even in AI-assisted workflows. AI systems sometimes produce translations that are grammatically correct but culturally or politically sensitive in ways the system cannot detect [28]. Translators regularly revise machine outputs to preserve the exact meaning of terms that carry legal weight [29]. Similarly, in religious translation, faith literacy and cultural knowledge ensure sacred texts maintain theological and emotive integrity [29]. These cases demonstrate where human expertise secures semantic authenticity, preventing mechanical literalism from distorting intended meaning. While LLMs can generate contextually aware drafts and improve efficiency, they still require human correction for high-stakes communication.

Human translators also ensure accountability and interpretive depth across professional, socio-economic, and moral dimensions. Professionally, translators make informed choices considering audience needs, cultural norms, and institutional standards. Socio-economically, human oversight preserves fair market practices and prevents AI from concentrating control over multilingual content in the hands of a few technology owners. Morally, translators evaluate potential consequences, anticipate cultural impact, and exercise empathy—abilities absent in AI [30]. This structured view clarifies the ethical obligations of human translators and the limitations of AI in fulfilling them independently. Machines may enhance speed and consistency, but they cannot assume responsibility for the social and ethical consequences of translation decisions.

Socio-technical systems theory provides insight into why human interpretive reasoning is vital for sustainable language service delivery. Technology performs best when it complements human judgment and creative problem-

solving[30]. In translation workflows, the social subsystem—human translators, institutional protocols, and professional norms—interacts with the technical subsystem—AI tools, software, and computational resources—to produce robust communicative outcomes. Continuous human intervention is necessary to maintain relevance in dynamic sociolinguistic contexts. Evidence from professional practice shows that institutions using such models maintain quality by clearly defining tasks for AI and human translators, balancing efficiency with interpretive integrity.

Debates persist about the future balance of human and machine roles. Hybrid workflows, where AI produces initial drafts and humans provide revision and context-sensitive editing, are a practical compromise. Prioritising speed over human judgment risks reducing translators to technical operators rather than cultural mediators. However, automation can also free translators from repetitive tasks, enabling them to focus on creative, interpretive, and ethical work, showing that AI and human expertise can be complementary. Institutions must adapt professionalism to include technological literacy without diminishing interpretive authority. Maintaining this balance ensures translation continues to be socially responsible, culturally accurate, and morally sound. Human expertise remains indispensable not only for correction but for sustaining communication as an act of understanding rather than mechanical transmission.

5. Towards a Synergistic Model of AI–Human Collaboration

The future of language services depends on integrating artificial intelligence as a supportive tool rather than replacing human translators. Automation achieves its greatest value when it enhances human decision-making instead of substituting it[31]. Neural machine translation now processes preliminary drafts quickly, but human expertise is required to refine style, pragmatic meaning, and context-specific choices. The most effective translation systems treat AI as an extension of human ability, supporting tasks without assuming full interpretive control[32]. Recent developments in large language models (LLMs) allow for more context-aware and coherent outputs, which can reduce repetitive cognitive effort, but human oversight remains necessary for cultural and ethical judgment[33, 34]. Socio-technical theory explains that sustainable systems operate when technical and social components function in balance. In this framework, AI amplifies human skills while humans retain authority over interpretive and moral dimensions, creating a complementary model of collaboration.

Hybrid translation workflows are a key example of this balanced approach. Post-editing of machine translation outputs is a professional task that requires linguistic creativity and contextual reasoning. Translators intervene to correct pragmatic errors, restore idioms, and ensure terminological precision—tasks beyond AI's current capabilities. Hybrid workflows increase productivity while maintaining stylistic and cultural accuracy[35]. At the same time, these systems demonstrate that AI can free humans from repetitive work, allowing them to focus on tasks that require judgment, ethical reflection, and linguistic creativity. Institutional policies must ensure that AI augmentation empowers rather than marginalises translators, preserving professional status and interpretive authority. Socio-technical analysis helps map role boundaries and feedback loops in workflows, showing where humans and AI intersect and which tasks require supervision, rather than simply assuming human oversight is required everywhere.

Capacity-building and ethical regulation support sustainable human–AI collaboration. Training programmes that teach post-editing while fostering critical engagement with AI outputs should be emphasised. Translators learn to identify cultural distortion, ethical risks, and algorithmic limitations. Transparency in AI use is necessary to prevent exploitation and data misuse[36]. Ethical frameworks should address professional, socio-economic, and moral-philosophical dimensions: professionals must maintain accountability and interpretive integrity, organisations must ensure fair labour and equitable access, and translators must exercise moral judgment in context-sensitive communication. Professional practices confirm that these interventions sustain communication quality and social responsibility in AI-assisted translation.

Evidence from global industry illustrates the benefits of human–AI synergy. In Japan, firms implement collaborative systems where human translators supervise AI-generated drafts in real time, improving speed and quality[37]. In the European Union, the Directorate-General for Translation combines neural machine translation with human review to maintain terminological and contextual consistency[38]. These ex-

amples show that AI–human integration enhances productivity without sacrificing cultural or pragmatic accuracy. Institutional success depends on continuous training and adaptive workflow design, as technological improvements can shift task boundaries and cognitive demands. Socio-technical theory provides insight into designing these adaptive workflows, clarifying professional responsibilities, feedback loops, and task allocation to maximise both efficiency and interpretive fidelity.

This model represents a shift in understanding translation as a cognitive–socio-technical activity. Meaning emerges from interaction between human reasoning and technological mediation [39]. When translators engage critically with AI, they transform processes from mechanical execution into collaborative interpretation. Balancing efficiency and authenticity protects the communicative essence of human language. Automation can reduce repetitive workload, allowing human translators to concentrate on ethical, creative, and context-sensitive decisions, demonstrating the potential of a balanced approach. Socio-technical principles remind institutions that gains in speed must not compromise moral or cultural accountability. Integrating human insight with AI ensures that productivity, accuracy, and interpretive quality coexist, sustaining translation as both a practical and socially responsible practice.

The following figure (**Figure 1**) is a visual representation created from the conceptual discussion presented in this section, illustrating the relative strengths of human and AI contributions at different stages of the translation workflow. The values depicted are not drawn from external empirical data, but rather constructed to reflect the argument that translation work benefits most when technological efficiency is balanced with human interpretive insight and ethical judgment.

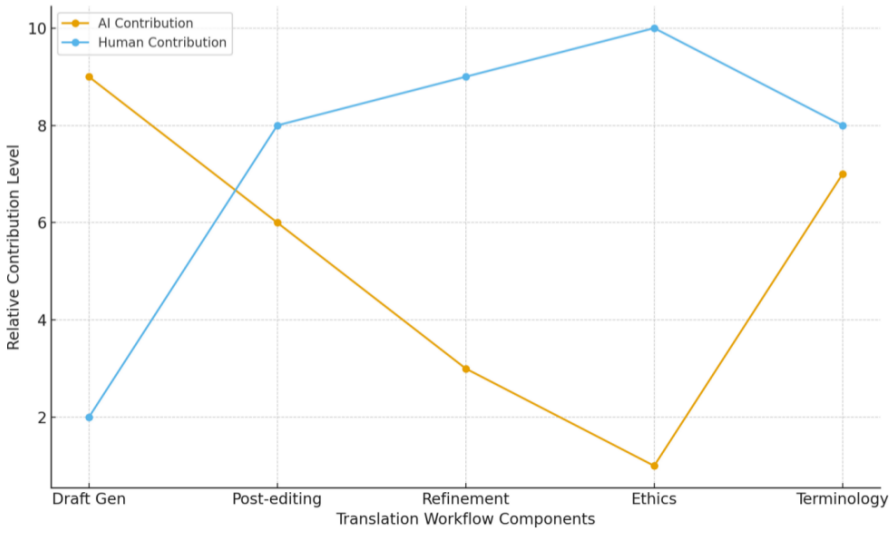

Figure 1. Synergistic Human–AI Contribution across Translation Stages.

Figure 1 illustrates the respective strengths of artificial and human contributions across key stages in the translation workflow, showing a pattern of complementary rather than competing roles. AI demonstrates its greatest impact at the initial draft generation stage, where automation efficiently produces baseline translations at speed, while human input remains minimal. As the process advances towards post-editing and pragmatic refinement, human involvement increases significantly, reflecting the need for cultural awareness, contextual reasoning, and sensitivity to idiomatic expression—areas where machines are comparatively limited. The contrast becomes most pronounced at the ethical oversight stage, in which human responsibility and interpretive agency reach their peak, reaffirming the irreplaceability of moral judgment and accountability in multilingual communication. Although AI regains relevance in terminology management, human expertise still retains predominance. Thus, the figure reinforces the argument that sustainable translation practice requires balanced synergy rather than technological dominance, ensuring productivity without compromising communicative authenticity.

6. Policy, Education, and Professional Implications

The integration of artificial intelligence into language services has reshaped the requirements for policy, education, and professional practice. Modern translation and interpreting now demand technological literacy alongside linguistic skill[40]. Neural machine translation and automated localisation tools have expanded the potential for AI-assisted workflows, but human expertise remains critical for ensuring pragmatic and stylistic fidelity. Bowker and Digital competence is no longer optional; it is essential for professional survival in hybrid environments. Recent advancements in large language models (LLMs) allow systems to handle context and semantic coherence more effectively, but these outputs still require human evaluation for cultural and ethical appropriateness[40–42]. Current curricula often prioritise traditional theory over practical engagement with emerging technologies[10], leaving graduates unprepared for professional realities. Reforming education to balance linguistic theory, technological skills, and ethical awareness is essential for developing competent practitioners capable of operating in AI–human collaborative systems.

Ethical instruction must accompany technical training to address emerging challenges in AI-mediated translation. Uncritical use of algorithms can lead to data bias, privacy breaches, and the commodification of linguistic labour. AI alters agency and responsibility, raising questions about authorship and accountability[43]. Professional ethics include ensuring accuracy, cultural sensitivity, and transparency, socio-economic ethics involve fair labour practices and equitable access to technology, and moral-philosophical ethics require reflection on the broader societal consequences of AI-mediated communication. Embedding ethics into educational programmes equips students to critically evaluate AI outputs and make decisions that preserve professional integrity. This approach transforms technological literacy from an operational skill into a socially responsible practice that strengthens human oversight within automated workflows.

Policy frameworks must safeguard human roles and professional standards in AI-driven environments. Unchecked corporate control over translation technology risks marginalising human translators[44]. Fair labour policies and intellectual property rights ensure that human contributions are recognised and compensated. Globalisation has blurred the line between professional and machine-generated translation, making regulation critical to maintain professional status[45, 46]. Socio-technical analysis can identify how human and technical components interact in organisational systems, revealing which tasks should remain human-led, where automation can assist, and how oversight is structured. It should be emphasised that continuing professional development must be supported institutionally to allow translators to adapt to evolving technology. Balanced policy ensures that AI improves efficiency without displacing human agency or ethical responsibility.

Professional associations play a key role in aligning technological integration with ethical and professional standards. Bodies such as the International Federation of Translators (FIT) and the European Masters in Translation (EMT) network have begun incorporating digital literacy and AI ethics into accreditation criteria[47]. These organisations mediate between technology developers, educators, and practitioners to maintain quality and cultural sensitivity. Initiatives are often reactive; a more proactive stance would involve benchmarking AI integration to ensure equitable access and preservation of linguistic diversity[48, 49]. Socio-technical analysis clarifies how professional roles, institutional practices, and technology interact, enabling informed decision-making that balances efficiency with interpretive integrity.

Sustainable development of the language service industry requires coordinated action in policy, education, and professional practice. Effective collaboration between humans and AI ensures that technology enhances rather than replaces human expertise. Institutions must integrate AI literacy with ethical responsibility to prepare translators for hybrid workflows. Governments and regulatory bodies should protect human contribution, provide professional safeguards, and fund training initiatives. Optimistic perspectives emphasise that AI can reduce repetitive workloads, allowing translators to concentrate on tasks requiring judgement, creativity, and ethical reflection, demonstrating that efficiency and human oversight are compatible. The socio-technical perspective shows that optimal system performance depends on balancing technical innovation with human adaptability. In this model, AI serves as a tool for human advancement, while humans retain interpretive authority and moral accountability, securing the sustainability, quality, and social value of

language services.

7. Conclusions

The integration of artificial intelligence into language services presents both opportunities and challenges for professional translation. This paper contributes a conceptual insight by framing AI not as a replacement for humans but as a complementary tool that can be systematically integrated into workflows through socio-technical analysis. Long-standing discussions in Translation Studies have emphasised human oversight, but this study extends the argument by showing how tasks can be strategically allocated between AI systems and human translators to optimise both efficiency and interpretive accuracy. Complex tasks requiring cultural, pragmatic, and ethical judgement remain human-led, while repetitive or large-scale data processing can be delegated to AI, including recent advances in large language models (LLMs) that improve contextual coherence. This dual approach balances operational speed with professional accountability and ensures that human expertise is preserved while leveraging technological strengths

Ethical considerations in AI-mediated translation must be organised and explicit. Professional ethics, such as accuracy, transparency, and cultural sensitivity, are complemented by socio-economic ethics that protect fair labour and equitable access, and moral-philosophical ethics that reflect societal responsibility. The socio-technical systems perspective provides concrete guidance, showing how human roles, institutional practices, and AI tools interact within workflows to maintain quality and accountability. Visual models of this interaction serve as conceptual guides, illustrating feedback loops, task allocation, and oversight mechanisms, while acknowledging that they are illustrative and not prescriptive. This framework ensures that AI supports rather than diminishes human judgement, allowing technology to enhance productivity without compromising the interpretive and ethical dimensions that define professional translation.

Future research and policy development should focus on refining this human–AI collaboration. Empirical studies could examine the efficiency and accuracy of hybrid workflows across different languages and sectors, while educational programmes should integrate both AI literacy and ethics into curricula. Policy frameworks must safeguard human contribution, enforce fair labour standards, and ensure that AI integration does not erode professional authority. At a conceptual level, this study argues for a balanced model in which AI accelerates routine tasks and human translators retain control over interpretation, pragmatics, and ethical oversight. This paper, thus, articulates an operational and ethical synergy between AI and humans, offering a structured approach for sustainable, responsible, and effective translation in a digital era. These insights provide concrete directions for translation practice, institutional regulation, and future scholarship.

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