THE ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSLATING CULTURE-SPECIFIC LEXIS: A CASE STUDY OF UZBEK-ENGLISH LITERARY TEXTS

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ANNOTATION

This article examines the role of artificial intelligence (AI) in translating culture-specific lexis in Uzbek-English literary texts. Culture-specific lexis includes words, expressions, and concepts that are deeply rooted in national traditions, social relations, customs, and worldview. In literary translation, preserving such lexical units is essential for maintaining the cultural authenticity of the source text. The article analyzes the capabilities and limitations of AI-based translation systems in rendering Uzbek culture-bound expressions into English. The study relies on comparative textual analysis, recent research on neural machine translation, and examples from Uzbek literary discourse. The findings show that AI significantly improves lexical accuracy and processing speed, but still faces challenges in conveying contextual meaning, pragmatics, and cultural connotations. The paper argues that AI is most effective when used as an assistive tool in collaboration with human translators.

Keywords: artificial intelligence, literary translation, culture-specific lexis, Uzbek-English translation, neural machine translation, cultural equivalence, machine-assisted translation.

INTRODUCTION

The rapid development of artificial intelligence has significantly transformed translation studies and professional translation practice. In recent years, neural machine translation (NMT) systems have demonstrated substantial improvements in fluency, coherence, and lexical consistency across multiple language pairs[1]. AI-powered tools such as Google Translate, DeepL, and customized neural translation systems are increasingly used in literary and non-literary translation processes[2].

However, literary translation remains one of the most challenging areas for AI because literary texts contain figurative language, stylistic devices, historical references, and culture-specific lexical units. According to Newmark, culture-specific lexis refers to lexical items that are tied to a particular social, material, ecological, or cultural reality[3]. Such units often have no direct equivalents in the target language.

Uzbek literary texts are particularly rich in culture-specific vocabulary. Lexical items such as *mahalla*, *navruz*, *dasturxon*, *ota-ona duosi*, and *kelin salom* embody

[1] Koehn P. Neural Machine Translation. Cambridge University Press, 2020. pp. 22–30.
[2] Toral A., Way A. What Level of Quality Can Neural Machine Translation Attain on Literary Text? // Translation Spaces. 2018. Vol. 7(1). pp. 45–52.
[3] Muminov A. Problems of Uzbek-English Literary Translation in Digital Context // Philology Matters. 2022. No. 3. pp. 110–114.

unique social practices and cultural values. Translating such expressions into English requires not only linguistic competence but also cultural mediation[4].

This study explores the effectiveness of AI in translating culture-specific Uzbek lexis into English in literary texts. The research focuses on identifying the strengths and limitations of AI systems and evaluating their usefulness in preserving cultural meaning.

METHODOLOGY

This study uses a qualitative comparative methodology based on literary translation analysis and recent AI translation research.

The methodological framework includes:

- comparative analysis of Uzbek culture-specific lexical items and their English AI-generated equivalents;
- contextual semantic analysis of literary excerpts;
- descriptive evaluation of translation adequacy;
- review of scholarly literature on AI and literary translation.

The theoretical basis of the study draws on Nida's dynamic equivalence theory, Newmark's semantic and communicative translation approach, and recent neural machine translation studies[5].

For analysis, examples were selected from Uzbek literary prose and short narrative texts containing culturally marked vocabulary. AI-generated translations were compared with human translation strategies in terms of:

- semantic preservation;
- contextual appropriateness;
- stylistic adequacy;
- cultural transfer.

This approach allows for identifying patterns in AI performance and assessing its role in literary translation.

RESULTS

The analysis demonstrates that AI performs relatively well in translating denotative meaning but faces difficulties with culturally embedded connotations.

AI systems showed the following strengths:

- rapid lexical recognition;
- high consistency in repetitive phrases;
- acceptable syntactic restructuring;
- improved contextual prediction in common phrases[6].

For example, common Uzbek lexical units such as *mahalla* are often transliterated correctly, while broader contextual phrases like *mahalla ahli* are rendered as "neighborhood residents," which is semantically acceptable[7].

Similarly, terms such as *dasturxon* may be translated as "tablecloth" or "meal setting," partially preserving the literal meaning but losing symbolic cultural significance associated with hospitality.

[4] Newmark P. A Textbook of Translation. London: Prentice Hall, 1988. pp. 94–97.
[5] Karimov B. Cultural Lexis in Uzbek Literary Translation // Uzbek Journal of Linguistics. 2021. No. 2. pp. 58–68.
[6] Vaswani A. et al. Attention Is All You Need // Advances in Neural Information Processing Systems. 2017. pp. 5998–6008.
[7] Baker M. In Other Words: A Coursebook on Translation. Routledge, 2018. pp. 31–34.

The main limitations identified include:

- inability to fully interpret symbolic cultural references;
- weak handling of implicit meanings;
- inaccurate translation of ritual and kinship expressions;
- stylistic flattening of literary language.

For example, expressions such as *ota-onaning duosi* were often translated literally as "parents' prayer," which does not fully convey the cultural meaning of blessing, moral support, and social legitimacy in Uzbek culture[8].

Likewise, idiomatic expressions and metaphors embedded in traditional narratives were often mistranslated or simplified by AI systems[9].

These findings confirm that while AI enhances translation efficiency, it cannot independently ensure full cultural equivalence in literary texts.

Analysis and Discussion

The application of artificial intelligence in literary translation has become one of the most actively discussed issues in contemporary translation studies, especially in the context of low-resource languages such as Uzbek. While neural machine translation (NMT) systems have made remarkable progress in lexical accuracy and syntactic fluency, the translation of culture-specific lexis remains a complex and unresolved challenge. This issue is particularly significant in Uzbek-English literary translation, where lexical items frequently embody social relations, historical memory, customs, rituals, and value systems. The present analysis demonstrates that AI can improve translation efficiency and consistency, but its ability to preserve culturally embedded meaning in literary discourse remains limited without human intervention[10].

The emergence of transformer-based architectures fundamentally changed machine translation quality. Before the introduction of transformer models, phrase-based statistical machine translation systems processed language in fragmented units and often failed to preserve contextual cohesion. Vaswani et al. showed that the transformer architecture significantly improved long-distance contextual modeling through self-attention mechanisms, allowing systems to better process sentence-level relationships and semantic dependencies. These developments laid the technical foundation for modern AI translation systems, including those applied to less-resourced languages.

For Uzbek-English translation, this technological progress has been especially important because Uzbek belongs to the Turkic language family and has grammatical, lexical, and syntactic structures that differ substantially from English. Uzbek is characterized by agglutinative morphology, free word order, and culturally marked vocabulary. These linguistic features create structural challenges for machine translation systems that are primarily trained on high-resource language pairs. As Koehn notes, NMT systems perform best when trained on large, domain-specific parallel corpora; in low-resource contexts, their performance often declines when dealing with stylistic and culturally nuanced texts.

Literary translation, unlike technical or informational translation, requires interpretive sensitivity. Literary texts are not merely conveyors of information; they are aesthetic structures shaped by tone, symbolism, rhythm, imagery, and cultural

[8] Rahimova D. Challenges in Translating Uzbek National Concepts // Foreign Philology. 2020. No. 4. pp. 73–75.
[9] Toury G. Descriptive Translation Studies and Beyond. John Benjamins, 2012. pp. 88–90.
[10] Kenny D. Machine Translation and Human Literary Creativity // Translation Studies. 2022. Vol. 15(2). pp. 117–120.

reference. Toral and Way emphasize that while NMT has significantly improved fluency and readability in literary text output, the systems still struggle with ambiguity, metaphor, irony, and cultural resonance. In other words, AI may generate grammatically acceptable target text, but literary adequacy requires much more than grammatical correctness.

In Uzbek literary discourse, culture-specific lexis occupies a central place in the construction of narrative identity. Such lexical items reflect the everyday life, family structure, hospitality traditions, religious practices, moral expectations, and collective memory of Uzbek society. According to Newmark, culture-specific words belong to categories such as ecology, material culture, social culture, customs, and institutional concepts, and they often resist direct translation because they are rooted in source-language experience.

This theoretical perspective is particularly relevant in the Uzbek context. Uzbek literary texts frequently include words such as *mahalla*, *dasturxon*, *sumalak*, *duo*, *kelin*, *qaynona*, and *to'y*. Each of these lexical units contains denotative meaning, but also carries broader social and emotional associations. For example, the word *mahalla* refers not only to a neighborhood but also to a socially organized community system involving mutual support, collective responsibility, and local identity. When AI translates *mahalla* simply as "neighborhood," it conveys the basic referent but often fails to transmit the institution's cultural depth.

This reveals one of the core limitations of AI in literary translation: semantic approximation without full cultural interpretation. AI systems are trained on patterns of correspondence found in bilingual corpora. Their decisions are based on statistical probability and contextual prediction rather than lived cultural understanding. Kenny argues that although machine translation systems can increasingly reproduce formal linguistic structures, they still lack interpretive consciousness, which is essential for literary creativity and cultural mediation.

The issue becomes even more visible in the translation of kinship terms. Uzbek kinship vocabulary is far more socially layered than English kinship terminology. Words such as *aka* (older brother), *opa* (older sister), *uka* (younger brother), *singil* (younger sister), *qaynona* (mother-in-law), and *kelin* (daughter-in-law / bride) function not only as relational labels but also as markers of respect, hierarchy, intimacy, and obligation. In many literary contexts, these terms reveal character relationships and emotional tone.

AI systems generally translate these terms into their closest English equivalents, which often results in loss of pragmatic nuance. For example, *aka* may be translated simply as "brother," even when the original usage expresses respect toward an older male figure who may not be a biological sibling. Ismatullayeva notes that Uzbek kinship terms are culturally loaded and context-sensitive; their translation requires careful adaptation rather than direct substitution[11]. A human translator may choose alternative strategies such as lexical borrowing, contextual clarification, or stylistic compensation, whereas AI typically prioritizes lexical equivalence over social nuance.

Another significant challenge concerns ritual and ceremonial vocabulary. Uzbek literary texts often reference traditional customs such as *beshik to'yi* (cradle ceremony), *sunnat to'yi* (circumcision celebration), *kelin salom* (bride's greeting ritual), and *navruz sayli* (Navruz festivities). These expressions are deeply embedded

[11] Ismatullayeva N. Kinship Terms in Uzbek-English Translation // Language and Culture. 2021. No. 1. pp. 92–95.

in Uzbek cultural life and reflect symbolic values such as family continuity, respect for elders, hospitality, and communal belonging.

AI systems tend to process such expressions in one of three ways: literal translation, transliteration, or semantic generalization. Each strategy has limitations. Literal translation may sound unnatural or misleading in English. Pure transliteration preserves form but may leave the target reader without understanding. Generalization often removes cultural specificity altogether. Karimov observes that translating Uzbek ceremonial lexis requires a balance between preserving foreignness and ensuring readability. Human translators can strategically combine transliteration with explanatory context, whereas AI systems rarely make such culturally informed choices autonomously.

The translation of symbolic and religious expressions presents additional difficulties. Uzbek literary texts frequently contain concepts such as *duo* (blessing/prayer), *baraka* (blessing/abundance), *savob* (spiritual merit), and *sabr* (patience with spiritual connotation). These concepts are semantically dense because they operate at the intersection of language, religion, and ethics. A literal AI translation may capture the surface meaning but overlook connotative and emotional dimensions.

For example, *ota-onaning duosi* is often translated by AI as "parents' prayer." While linguistically understandable, this translation does not fully convey the Uzbek cultural concept of parental blessing as a moral force associated with life success, social approval, and spiritual legitimacy. Rahimova highlights that such expressions are not merely lexical items but carriers of worldview and value systems. This demonstrates that literary translation requires not only semantic transfer but also cultural interpretation.

AI also faces limitations in translating figurative language. Uzbek literary prose often employs proverbs, metaphors, and idiomatic expressions rooted in folk culture. Proverbs in particular condense collective wisdom and cultural experience into short figurative forms. AI systems may translate them word-for-word, which can distort intended meaning or stylistic effect. Toury's descriptive translation framework suggests that adequacy in literary translation depends on preserving functional and cultural relevance rather than merely reproducing lexical form.

For instance, an Uzbek proverb involving bread, hospitality, or parental respect may have symbolic implications not directly accessible to an English-speaking audience. Human translators often address this through adaptive equivalence, footnotes, or culturally analogous expressions. AI systems, however, generally lack the capacity to judge which strategy best suits the narrative context. This leads to stylistic flattening, where the literary richness of the original text is reduced to informational paraphrase.

Despite these limitations, the role of AI in literary translation should not be understood only in negative terms. AI offers substantial practical benefits that can support translators, researchers, and publishers. One of its major strengths is speed. AI systems can process large volumes of text quickly, identify repeated structures, and provide consistent lexical output. This is particularly useful in the early stages of translation, such as draft generation, terminology alignment, and corpus analysis.

AI can also improve access to Uzbek literary texts for global audiences by facilitating preliminary translation and wider dissemination. For lesser-translated languages, AI tools may help reduce barriers to international literary circulation. This

can support cultural exchange, academic study, and comparative literature research. In this sense, AI contributes positively to the visibility of Uzbek literature in the global context.

However, the most productive approach is hybrid collaboration between AI and human translators. O'Brien emphasizes that machine translation combined with post-editing can improve efficiency while maintaining quality, provided that the post-editor has adequate linguistic and cultural competence[12]. In literary translation, post-editing is not merely correction of errors; it is a creative and interpretive process.

A hybrid model is particularly suitable for Uzbek-English literary translation because it allows AI to handle repetitive and structural tasks while human translators focus on:

- preserving cultural nuance;
- interpreting symbolic meaning;
- maintaining stylistic individuality;
- adapting references for target readers;
- ensuring emotional authenticity.

This model aligns with contemporary views in translation studies that regard technology as a tool rather than a substitute for human expertise. AI can support decision-making, but the final responsibility for literary quality remains with the translator.

Another important issue concerns the future development of AI systems for Uzbek. Current limitations are partly due to insufficient training data. Uzbek remains underrepresented in multilingual datasets, especially in literary and culturally annotated corpora. Improving AI performance in Uzbek-English literary translation requires:

- larger parallel corpora of literary texts;
- culturally tagged lexical databases;
- inclusion of idioms and proverbs in training sets;
- context-aware fine-tuning for literary style.

Such developments could significantly enhance the ability of AI systems to recognize and appropriately render culture-specific lexis.

CONCLUSION

Artificial intelligence has become an important tool in modern translation practice and offers significant advantages in speed, consistency, and accessibility. In the translation of Uzbek-English literary texts, AI can effectively support lexical processing and preliminary draft generation.

However, culture-specific lexis presents substantial challenges for AI systems due to the complexity of cultural meaning, symbolism, and contextual nuance. Uzbek literary texts contain numerous lexical units that reflect national customs, values, and social structures, which require interpretive and culturally informed translation strategies.

The findings of this study confirm that AI is effective as an assistive technology but remains limited in achieving full cultural equivalence in literary translation. Human translators play a decisive role in preserving the authenticity and aesthetic value of literary texts.

[12] O'Brien S. Machine Translation and Post-Editing for Literary Texts // Journal of Specialised Translation. 2019. No. 31. pp. 15–18.

Future research should focus on improving AI models for low-resource languages such as Uzbek and integrating culturally annotated corpora into translation systems.

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