# CONTEXTUAL AND CULTURAL INTERPRETATION IN

# AI-DICTIONARIES

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**Annotation**

The increasing use of artificial intelligence in multilingual translation platforms has raised important questions about how context-dependent meanings and culturally specific linguistic units are interpreted and transferred across languages. This study explores contextual and cultural adaptation in AI-based translation systems from a linguistic perspective. The research analyzes how AI models interpret culturally marked expressions, pragmatic meanings, and context-dependent linguistic units. Comparative analysis reveals that while AI translation tools demonstrate high efficiency in lexical and grammatical equivalence, challenges remain in preserving cultural nuances and implicit meanings. The findings highlight the necessity of integrating linguocultural knowledge and contextual awareness into AI translation models to ensure more accurate and culturally appropriate translations.

**Key words:**

artificial intelligence, machine translation, contextual adaptation, cultural adaptation, linguocultural analysis, translation models, semantic equivalence.

**Annotatsiya.**          Ko'p tilli tarjima platformalarida sun'iy intellekt texnologiyalaridan foydalanish ortib borishi kontekstga bog'liq ma'nolar hamda madaniy jihatdan xos til birliklarining tarjimada qanday talqin qilinishi masalasini dolzarb qilib qo'ymoqda. Ushbu tadqiqot sun'iy intellekt asosidagi tarjima tizimlarida kontekstual va madaniy moslashuv jarayonlarini lingvistik nuqtai nazardan o'rganishga qaratilgan. Tadqiqot davomida madaniy belgili birliklar, pragmatik ma'nolar hamda kontekstga bog'liq til birliklarining AI orqali tarjima qilinish xususiyatlari tahlil qilinadi. Natijalar shuni ko'rsatadiki, AI tarjima vositalari leksik va grammatik ekvivalentlikni yuqori darajada ta'minlasa-da, madaniy nozikliklar va yashirin ma'nolarni saqlashda ayrim muammolar mavjud. Tadqiqot AI tarjima modellarida lingvomadaniy bilim hamda kontekstni chuqur hisobga olish zarurligini ko'rsatadi.

**Kalit so'zlar:** sun'iy intellekt, mashina tarjimasi, kontekstual moslashuv, madaniy moslashuv, lingvomadaniy tahlil, tarjima modellari, semantik ekvivalentlik.

**Аннотация.** Рост использования технологий искусственного интеллекта в многоязычных переводческих платформах усилил проблему передачи контекстно обусловленных значений и культурно специфических языковых единиц при переводе между языками. Данное исследование посвящено анализу контекстуальной и культурной адаптации в системах перевода на основе искусственного интеллекта с лингвистической точки зрения. В работе рассматриваются особенности интерпретации культурно маркированных единиц, прагматических значений и контекстно-зависимых языковых элементов в AI-переводе. Сравнительный анализ показывает, что, несмотря на высокую эффективность AI-систем в обеспечении лексико-грамматической эквивалентности, сохраняются трудности в передаче культурных нюансов и скрытых смыслов. Результаты исследования

подчеркивают необходимость интеграции лингвокультурных знаний и контекстуальной адаптации в модели машинного перевода.

**Ключевые слова:** искусственный интеллект, машинный перевод, контекстуальная адаптация, культурная адаптация, лингвокультурный анализ, переводческие модели, семантическая эквивалентность.

**Introduction.** Recent advances in artificial intelligence have significantly reshaped translation practices, particularly through the widespread use of AI-powered translation platforms such as ChatGPT, Yandex Translate, and Google Translate. These systems are increasingly applied in academic, professional, and everyday communication, allowing users to access fast multilingual translation solutions. Despite their growing popularity, questions remain concerning how effectively these platforms transfer context-dependent meanings and culturally marked linguistic units across languages.

Machine translation technologies have evolved from rule-based systems to statistical and neural models, resulting in substantial improvements in grammatical accuracy and lexical correspondence. Modern AI-driven translation tools are capable of processing large-scale linguistic data and generating fluent target texts. However, translation quality cannot be evaluated solely in terms of structural correctness, since language reflects cultural concepts, pragmatic intentions, and contextual meanings that often extend beyond literal equivalence[1].

From a linguistic perspective, contextual and cultural adaptation represent key criteria in evaluating translation adequacy. Contextual adaptation refers to the ability of a translation system to interpret meaning according to discourse, situational context, and communicative intention, while cultural adaptation involves the transfer of culture-bound concepts in a way that remains meaningful for the target audience[2]. These aspects are particularly important when translating idiomatic expressions, proverbs, or ethnoculturally marked units, where literal translation may distort or neutralize the original meaning.

Previous research has shown that AI translation systems often achieve high results in lexical and syntactic accuracy but still face challenges when dealing with culturally embedded meanings and pragmatic nuances[3]. Since different AI platforms rely on distinct algorithms, training datasets, and language models, their translation outputs may vary significantly when interpreting the same linguistic unit. Comparative analysis of multiple AI translation systems therefore provides valuable insights into how contextual and cultural adaptation is handled within contemporary AI models.

In this regard, the present study focuses on a comparative linguistic analysis of translations generated by ChatGPT, Yandex Translate, and Google Translate. The research examines how these platforms interpret selected linguistic units containing contextual and cultural elements and evaluates the degree of semantic preservation, cultural adequacy, and pragmatic accuracy. To provide empirical evidence, the study incorporates a comparative table

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[1] Baker M. *In Other Words*: A Coursebook on Translation. – London: Routledge, 2018. – 352 p.; House J. Translation Quality Assessment: Past and Present. – London: Routledge, 2015. – 290 p.

[2] Koehn P. Neural Machine Translation. – Cambridge: Cambridge University Press, 2020. – 393 p.; Popović M. Error classification and analysis for machine translation quality evaluation // Computational Linguistics. – 2019. – Vol. 45(3). – P. 455–478.

[3] Toral A., Way A. What level of quality can neural machine translation attain on literary text? // *Translation Spaces*. – 2018. – Vol. 7(1). – P. 124–145.; Venuti L. The Translator's Invisibility: A History of Translation. – London: Routledge, 2012. – 336 p.

presenting translation variants produced by the three platforms, allowing for systematic analysis of similarities, differences, and typical translation shifts. By combining linguocultural analysis with practical AI translation comparison, the study aims to contribute to the understanding of contextual and cultural adaptation in modern AI translation systems and to highlight the strengths and limitations of widely used AI-based translation tools.

## Literature Review

Recent studies show that artificial intelligence–based translation systems have become increasingly effective in producing grammatically correct and fluent translations. However, researchers emphasize that automatic translation quality should also be evaluated from contextual and cultural perspectives, since meaning in language depends on discourse situation and cultural background (Castilho et al., 2018). AI translation platforms often rely on statistical and neural patterns, which may result in accurate lexical output but limited interpretation of implicit meanings. Contextual adaptation in translation is viewed as the ability to interpret language according to communicative intention and situational factors. Studies in computational linguistics indicate that AI systems still face difficulties in processing pragmatic meanings and context-dependent expressions, especially in cross-cultural communication[4]. This limitation becomes more visible when translating figurative or culturally bound units.

Cultural adaptation remains another challenging area for AI translation. Researchers note that machine translation frequently simplifies or neutralizes culturally specific concepts, leading to semantic shifts or loss of cultural nuance (Pym, 2010). While modern AI tools show significant progress, comparative linguistic studies focusing on differences between major AI platforms remain limited. Therefore, this study conducts a comparative analysis of translation outputs generated by ChatGPT, Google Translate, and Yandex Translate, focusing on contextual and cultural adaptation.

## Methodology

This study applies a comparative linguistic analysis to examine contextual and cultural adaptation in AI-based translation systems. The research focuses on three widely used translation platforms: ChatGPT, Google Translate, and Yandex Translate. These systems were selected due to their broad accessibility and different underlying AI architectures, which allow for meaningful comparison of translation outputs. The research data consist of selected linguistic units containing contextual and culturally marked meanings, including idiomatic expressions and culture-related phrases. The same source units were translated using the three AI platforms, and the results were organized into a comparative table for systematic analysis.

Translation outputs were evaluated based on the following criteria: lexical accuracy, contextual adequacy, preservation of cultural meaning, and semantic equivalence. The comparative table serves as the main analytical tool, enabling the identification of similarities, differences, and typical translation shifts across the three AI systems. The analysis aims to reveal how effectively each platform adapts translation to context and cultural background from a linguistic perspective.

**Table 1. Comparative Translation of Uzbek Culture-Specific Units by AI Systems.**

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[4] Farghaly A., Shaalan K. Arabic Machine Translation: Techniques, Challenges and Future Directions // Machine Translation. – 2009. – Vol. 23. – P. 3–29.

| No. | Uzbek cultural unit | Yandex | Google Translate | ChatGPT | Lost layer | Linguocultural analysis |
|---|---|---|---|---|---|---|
| 1 | Oq fotiha berish | White conqueror giving | Funeral prayer | Marriage blessing | Religious–conceptual | Religious approval before marriage is distorted or reduced. |
| 2 | Sovchi qo'yish | Marriage proposal | Proposing marriage | Sending matchmakers | Ritual | Traditional matchmaker institution is neutralized. |
| 3 | Beshik to'yi | Cradle wedding | Cradle ceremony | Cradle ceremony | Ritual | Cultural newborn ritual is generalized. |
| 4 | Chilla to'yi | Chilla wedding | Forty-day celebration | Forty-day celebration | Ritual | Specific "chilla" tradition loses ethnocultural depth. |
| 5 | Kelin tushirish | Bridal drop | Bringing bride | Welcoming bride | Ritual | Bridal entrance ceremony meaning is simplified. |
| 6 | Elchi bo'lib borish | Ambassador | Mediator | Family mediator | Social–custom | Family negotiation function is weakened. |
| 7 | Halol luqma | Honest bite | Halal morsel | Lawful earning | Religious–ethical | Ethical concept of halal livelihood is reduced. |
| 8 | Peshonaga yozilgan | Written forehead | Written on forehead | Destined | Religious–metaphor | Fate metaphor partly lost in literal translation. |
| 9 | Ko'ngli keng | Wide range | Broad-minded | Open-hearted | Metaphor | Cultural metaphor of generosity partially neutralized. |
| 10 | Sabr kosasi | Bowl patience | Cup patience | Limit of patience | Metaphor | Idiomatic meaning is lost in literal renderings. |

**Comparative Analysis of Contextual and Cultural Adaptation in AI Translation**

The comparative analysis of translation outputs generated by ChatGPT, Google Translate, and Yandex Translate reveals noticeable differences in the interpretation of culturally marked Uzbek linguistic units. The results demonstrate that although all three AI systems generally provide understandable translations, the degree of contextual and cultural adaptation varies significantly depending on the type of expression.

One of the clearest examples is the expression *"Oq fotiha berish."* While ChatGPT translates it as *"marriage blessing,"* which partially preserves the cultural meaning, Google Translate interprets it as *"funeral prayer,"* and Yandex produces an incorrect literal rendering. This shows how religiously grounded concepts may be misinterpreted when systems fail to recognize cultural context. The semantic shift here results in the loss of the original conceptual meaning related to parental religious approval before marriage. Similar tendencies are observed in ritual expressions such as *"Sovchi qo'yish"* and *"Kelin tushirish."* ChatGPT tends to provide culturally closer equivalents like *"sending matchmakers"* or *"welcoming bride,"* while other platforms simplify these units into general expressions such as *"marriage proposal"* or grammatically incorrect literal phrases. As a result, the institutional and social aspects of Uzbek marriage traditions are reduced, demonstrating a process of cultural neutralization.

Ritual terms related to life-cycle events also show partial semantic loss. Expressions like *"Beshik to'yi"* and *"Chilla to'yi"* are translated as *"cradle ceremony"* or *"forty-day celebration,"* which convey basic meaning but fail to reflect their culturally fixed status within Uzbek traditions. The translations remain descriptively accurate but lack ethnocultural specificity, indicating that AI systems prioritize lexical clarity over cultural depth. Social and ethical concepts reveal another level of variation. For example, the phrase *"Elchi bo'lib borish"* is rendered as *"ambassador"* by Yandex, reflecting literal lexical correspondence but ignoring the cultural function of a family mediator. Similarly, *"Halol luqma"* illustrates differences in conceptual interpretation: while ChatGPT provides the broader ethical meaning *"lawful earning,"* other systems reduce the phrase to food-related expressions, thereby weakening its religious and moral dimension.

Metaphorical expressions demonstrate the greatest challenges for AI translation. Units such as *"Ko'ngli keng," "Sabr kosasi,"* and *"Peshonaga yozilgan"* frequently undergo literal translation, resulting in phrases like *"wide range"* or *"cup patience."* These outputs illustrate the inability of some systems to decode conceptual metaphors embedded in the source language. ChatGPT generally shows stronger contextual interpretation by producing functional equivalents such as *"open-hearted"* or *"destined,"* yet even these translations may not fully preserve the cultural and emotional layers of meaning.

## Discussion

The comparative analysis demonstrates that AI translation systems show different levels of success in handling contextual and cultural adaptation. While all three platforms generate grammatically understandable outputs, their ability to preserve linguocultural meanings varies depending on the type of linguistic unit. ChatGPT generally provides more context-oriented translations, especially in cases involving metaphorical and pragmatically marked expressions. In contrast, Google Translate and Yandex Translate tend to rely more on lexical or literal equivalents, which often leads to partial semantic loss. The findings confirm that ritual, religious, and culture-bound expressions represent the most challenging category for AI translation systems.

Another important observation concerns metaphorical language. AI systems often process metaphors literally, which weakens their emotional and cultural meaning. Although modern AI models demonstrate improved contextual understanding, they still lack sufficient cultural awareness to fully preserve symbolic and ethnocultural layers of meaning. This indicates that current AI translation technologies remain primarily language-oriented rather than culture-oriented. **Conclusion**

This study explored contextual and cultural adaptation in AI-based translation through a comparative linguistic analysis of translations generated by ChatGPT, Google Translate, and Yandex Translate. The findings show that while AI translation systems effectively maintain grammatical and lexical correctness, they frequently fail to fully preserve cultural, ritual, and metaphorical meanings embedded in the source language.

Among the analyzed platforms, ChatGPT demonstrated relatively stronger contextual interpretation, whereas Google Translate and Yandex Translate often produced literal or simplified translations. However, all systems showed limitations in transmitting deep linguocultural concepts, particularly those requiring cultural background knowledge.

The study confirms that contextual and cultural adaptation remains a major challenge in AI translation. Future research may focus on expanding linguocultural datasets, improving context-aware AI models, and developing translation approaches that better integrate cultural semantics. Such improvements would contribute to more accurate and culturally sensitive AI-assisted translation systems.

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