ОСОБЕННОСТИ ПЕРЕВОДА ИДИОМ ПРИ ИСПОЛЬЗОВАНИИ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация

Несмотря на значительный прогресс в развитии машинного перевода (МП), перевод идиоматических выражений остается сложной задачей. Идиомы часто несут скрытый смысл, который нельзя передать дословно, а их правильный перевод требует не только языковой, но и культурной адаптации. Современные нейросетевые модели демонстрируют высокую степень беглости и грамматической точности, но по-прежнему сталкиваются с проблемами в передаче фигурального значения. Машинный перевод часто приводит к буквальному переводу, потере смысловых оттенков и культурным несоответствиям. Это подчеркивает важность человеческого участия в переводе, особенно в контекстах, где необходимо учитывать культурные и стилистические особенности. В работе рассматриваются основные трудности, возникающие при передаче идиом в машинном переводе, и их влияние на межъязыковую коммуникацию. Для повышения точности перевода необходимо дальнейшее развитие технологий, способных учитывать контекст и смысловую многозначность языка.

Keywords: машинный перевод, идиоматические выражения, искусственный интеллект, культурная адаптация, семантическая точность, стратегии перевода.

FEATURES OF IDIOM TRANSLATION USING ARTIFICIAL INTELLIGENCE

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Abstract

Machine translation (MT) has significantly advanced with the development of neural machine translation (NMT), improving fluency and grammatical accuracy. However, translating idiomatic expressions remains a major challenge due to the complexity of figurative language and cultural nuance. Idioms often carry meanings that cannot be understood through direct translation, requiring a deep understanding of both source and target languages. While AI-driven MT systems attempt to address these challenges, they frequently produce errors such as literal translation, loss of idiomatic meaning, and cultural misalignment. These limitations highlight the gap between computational linguistic processing and human cognitive abilities in translation. This study explores the difficulties MT systems face in idiomatic translation and the implications for cross-linguistic communication. Despite technological advancements, human expertise remains essential in contexts requiring cultural adaptation. Future developments should focus on improving AI's ability to recognize figurative language, ensuring more accurate and contextually appropriate translations.

Keywords: machine translation, idiomatic expressions, artificial intelligence, cultural adaptation, semantic accuracy, translation strategies.

Translation is more than a mechanical transfer of words from one language to another; it is a complex process that requires a deep understanding of linguistic structures, cultural context, and intended meaning. One of the most critical aspects of translation is cultural adaptation, which involves modifying a text so that it aligns with the cultural and linguistic norms of the target audience while preserving its original intent. Without proper cultural adaptation, translations can become misleading, unnatural, or even incomprehensible. This challenge is particularly evident in the translation of idiomatic expressions, which often carry figurative meanings that cannot be understood through direct, word-for-word translation. In recent years, machine translation (MT) has seen remarkable advancements, with AI-powered tools such as Google Translate, DeepL, and ChatGPT significantly improving linguistic accuracy and fluency. However, despite these improvements, MT systems continue to face substantial limitations in cultural adaptation. Unlike human translators, AI lacks real-world experiences, cultural intuition, and the ability to interpret meaning beyond literal definitions. Liu (2022) posits that the present AI technologies lack the requisite advancement to entirely supplant human translators. Although AI has made notable advancements in the domain of language translation, it still falls short of the nuanced

comprehension of language and cultural context that human translators possess. Moreover, human translators possess the capability to decipher idiomatic phrases and colloquial language, which could pose a challenge for AI to precisely translate. [4; 935] As a result, machine-generated translations often struggle with idiomatic expressions, leading to errors such as literal translation, idiomatic loss, mistranslation, and semantic shifts.

Translation has long been recognized as more than a mechanical process of converting words from one language to another. At its core, it involves negotiating meaning across cultural and linguistic boundaries. One of the central debates in translation studies revolves around the degree to which a translated text should remain faithful to the source language versus how much it should be adapted to fit the cultural norms of the target audience. Lawrence Venuti's (1995) theory of domestication and foreignization offers a useful framework for understanding cultural adaptation in translation. Domestication refers to a strategy where the translator modifies the text to make it sound natural and familiar to the target audience, often replacing culturally specific references with equivalents that are easily understood. On the other hand, foreignization seeks to preserve the original cultural and linguistic characteristics of the source text, even if they appear unusual or challenging to the target audience. While domestication enhances readability and accessibility, foreignization maintains the uniqueness and authenticity of the original expression. Idioms and culturally embedded expressions present a unique challenge within this framework. A domesticated translation might replace an idiom with a culturally appropriate equivalent in the target language, while a foreignized approach might provide a literal translation, preserving the original structure but potentially making the meaning less clear. The choice between these approaches depends on the translator's goals, the audience's expectations, and the context in which the translation is used.

With the rapid development of artificial intelligence, machine translation (MT) has undergone significant transformations. Modern AI-based MT systems, such as Google Translate, DeepL, and ChatGPT, rely on neural machine translation (NMT)— a deep-learning approach that processes entire sentences rather than translating words in isolation. These systems are trained on massive multilingual datasets, allowing them to identify patterns and generate translations that are often more fluent and grammatically correct than rule-based or statistical methods. However, AI translation contains deficiencies and technical issues originating from natural language processing. Neural networks work on fluency and coherence better yet they have some errors that a human translator would not commit (Tomasello, 2019). Such problem includes Homographs, Paronyms, and Ambigrammatical, which refer to words with the same pronunciation but have different meanings and different syntactical functions and the resultant effect is either grammatical inaccuracy or the production of a word

that is alien in meaning to the subject in question. [1; 8] Moreover, AI-driven MT still struggles with cultural adaptation and the translation of idiomatic expressions. Unlike human translators, AI lacks an intuitive understanding of culture, context, and pragmatics. Instead, it relies on statistical probabilities and pattern recognition, which often lead to literal translations that fail to capture the intended meaning of idiomatic phrases. Furthermore, since AI is trained on pre-existing translations, it can reinforce biases, inconsistencies, and errors present in its training data. Another fundamental limitation of MT is its inability to interpret and recreate metaphorical language in a way that aligns with the cultural expectations of the target audience. While AI can recognize frequently translated idioms, it often fails when faced with novel or low-resource idiomatic expressions. This highlights a crucial gap between AI's linguistic processing capabilities and the deeper cognitive and cultural reasoning required for effective translation.

Idioms are integral to every language, shaping the way people express ideas, emotions, and cultural values. Idioms are fixed expressions whose meanings cannot be deduced from the literal definitions of their individual words. Translating idioms has always been considered a challenging decision-making process for translators, which requires a lot of experience and creativity Even acknowledged and experienced translators, who ideally have a well-founded knowledge of the target language and its cultural aspects, cannot match the ability of native speakers in deciding when – meaning in what text type or context – certain idioms would or would not be appropriate A thorough knowledge of the source and target language is indispensable in this process, which also requires creativity and the skill, willingness, and perseverance to search for the best equivalent. [5; 86] From a translation perspective, idioms require a nuanced approach, as their direct translations often lead to misinterpretation or loss of meaning. Successful translation strategies may include: Equivalence - finding an idiom with a similar meaning in the target language; Paraphrasing - explaining the idiom's meaning instead of providing a direct translation; Literal Translation - a direct word-for-word translation, which often results in loss of meaning; Cultural Substitution - replacing the idiom with a culturally relevant phrase that conveys the same idea. Machine translation, however, frequently struggles with idioms because it lacks the ability to contextualize figurative language. AI models often default to literal translations, failing to recognize when an expression is being used idiomatically. This results in translations that may be grammatically correct but semantically incorrect or awkward.

To better understand the challenges AI faces in idiom translation, it is useful to consider Mona Baker's (1992) classification of idiom translation strategies. These strategies are: A. *Using an Idiom of Similar Meaning and Form* - this approach entails utilizing an idiom in the target language (TL) that has essentially the same meaning as

the source language's idiom and also contains lexical elements that are similar. B. *Using an Idiom of Similar Meaning but Dissimilar Form* - finding a fixed phrase or idiom in the target language that is composed of different lexical elements but has a comparable meaning to the source language's expression or idiom may be achievable. C. *Translation by Paraphrase* - due to variations in the stylistic preferences of the source and target languages, this is now the most popular method of translating idioms when a correspondence cannot be found in the target language or when it seems undesirable to employ idiomatic language in the target translation. D. *Translation by Omission* - an idiom could occasionally be completely omitted in the TT, just like it does with single words. It might not have a close equivalent in the target language (TL), its meaning may be difficult to interpret, or it might be for aesthetic reasons. [2; 141] While these strategies are widely used in human translation, AI systems often struggle to apply them effectively, leading to literal translations or semantic distortions.

This study examines the ability of machine translation (MT) systems to process idiomatic expressions by analyzing a random selection of Russian idioms. The idioms were not chosen based on frequency or common usage but were selected arbitrarily to assess how AI-driven translation tools handle non-literal and culturally embedded expressions. This approach ensures that the evaluation reflects the AI systems' ability to recognize, interpret, and adapt figurative language, rather than relying on pre-learned translations of well-known idioms. The translations were generated using three AI-based MT systems: Google Translate, DeepL, and ChatGPT. These tools were selected for their widespread use and advanced neural translation capabilities. The idioms were translated from Russian into English using each system without human intervention to ensure that the results reflect the raw output of AI processing.

Table 1: Translation

Russian Phrase	Google Translate	DeepL	ChatGPT
Божий одуванчик	God's dandelion	God's dandelion / Dandelion of God	Sweet old dear/ Little old lady
Дубина стоеросовая	Steros club	Stupid stooge / Stool pigeon	Big oaf/ Thickheaded
Закля́дочный друг	Bosom friend	A close friend/ A dear friend	Bosom friend / Close friend
Заячья душа	Hare soul	Hare's soul	Timid soul / Cowardly soul
Казанская сирота	Kazan orphan	A Kazan orphan / Kazan's orphan	False orphan / Feigned orphan

Жизнь бьёт ключом	Life is in full swing	Life is booming	Life is in full swing / Life is bustling
Кричит во всю Ивановскую	Screams at the top of Ivanovo	Shouting all over Ivanovo	Shouting at the top of one's lungs
Купаться в роскоши	Bask in luxury	Bathe in luxury	To wallow in luxury / To live in the lap of luxury
Не жизнь, а малина	Not life, but raspberries	Life is a raspberry	Life is a bed of roses
Делу время, потехе час	Time for business/ Time for fun	It's business as usual	A time for work and a time for play

Table 2: Translation Strategy Definitions

Translation Strategy	Definition
Literal Translation	Word-for-word substitution without considering cultural meaning.
Loan Translation (Calque)	Directly borrowing structure but adapting it to the target language.
Descriptive Translation	Explaining the meaning instead of direct substitution.
Equivalence (Idiomatic Translation)	Finding the closest equivalent phrase in the target language.
Generalization	Using a broader term instead of a specific cultural reference.
Adaptation (Cultural Substitution)	Replacing a culturally specific term with one familiar to the target audience.
Incorrect Translation (Mistranslation)	Producing a wrong or misleading result.

Table 3: Comparative Analysis of Translations

Phrase	Google Translate	Strategy (Google)	DeepL	Strategy (DeepL)	ChatGPT	Strategy (ChatGPT)
Божий одуванчик	God's dandelion	Literal	God's dandelion / Dandelion of God	Literal / Calque	Sweet old dear	Adaptation

Дубина стоеросовая	Steros club	Mistranslation	Stupid stooge / Stool pigeon	Generalization	Big oaf	Descriptive
Закля́дочный друг	Bosom friend	Equivalence	A close friend, a dear friend	Generalization	Bosom friend / Close friend	Equivalence
Заячья душа	Hare soul	Calque	Hare's soul	Calque	Timid soul / Cowardly soul	Equivalence
Казанская сирота	Kazan orphan	Literal	A Kazan orphan, Kazan's orphan	Literal	False orphan / Feigned orphan	Descriptive
Жизнь бьёт ключом	Life is in full swing	Equivalence	Life is booming	Equivalence	Life is in full swing / Life is bustling	Equivalence

The analysis of AI-generated translations reveals significant differences in how Google Translate, DeepL, and ChatGPT handle idiomatic expressions. The primary challenges observed across all three systems include literal translation, idiomatic loss, calque, mistranslation, and adaptation. While Google Translate demonstrated a strong tendency for literal word-for-word translation, DeepL showed a more nuanced approach but still struggled with idiomatic adaptation. ChatGPT, on the other hand, exhibited the strongest ability to produce culturally adapted translations but occasionally introduced over-interpretation, altering the original meaning.

Table 4: AI Translation Tools - Strengths & Weaknesses

Tool	Strengths	Weaknesses
Google Translate	Good for direct, basic translations.	Too literal, often produces unnatural phrases. Misunderstands idioms.

DeepL	More natural than Google Translate. Sometimes offers multiple options.	Still struggles with idioms. Lacks full cultural adaptation.
ChatGPT	Best at adapting idioms and cultural meanings. Uses natural English equivalents.	Sometimes over-adapts, losing original meaning. May introduce subjective interpretations.

The findings of this study indicate that machine translation (MT) systems continue to face significant challenges in processing idiomatic expressions, with errors stemming from the inability to account for cultural and figurative meaning. The most prevalent issues observed in AI-generated translations include literal translation, idiomatic loss, structural borrowing (calque), mistranslation, and over-adaptation. Among the three systems analyzed, Google Translate demonstrated the highest frequency of literal translations, producing outputs that closely followed the source text's structure but often failed to convey its intended meaning. DeepL, while more contextually aware, frequently applied calque strategies, leading to syntactically correct yet semantically unnatural translations. ChatGPT, by contrast, exhibited the most advanced capacity for cultural adaptation, successfully recognizing idiomatic meaning. However, it also displayed a tendency toward over-interpretation, sometimes modifying the original phrase to enhance fluency at the expense of strict semantic accuracy.

The inability of AI translation tools to accurately handle idiomatic expressions has significant implications for cross-linguistic communication and translation quality. While neural machine translation (NMT) systems have improved in fluency and grammatical coherence, they remain limited in semantic depth and cultural awareness, particularly in handling figurative language. The observed errors suggest that AI-generated translations cannot yet replace human expertise in contexts where idiomatic precision and cultural adaptation are essential. The limitations of AI in handling idiomatic expressions and cultural nuances highlight the ongoing need for human expertise in translation. However, the translation market is anticipated to be significantly impacted by AIpowered translation. Although artificial intelligence (AI) has novel prospects for the translation industry, the principal fallout from this developing social phenomenon is a change in the qualifications of translators or even the possibility of job displacement. [3; 18] As AI systems continue to evolve, translators may need to adapt by focusing on post-editing, quality assurance, and specialized translation tasks that demand cultural and contextual sensitivity. Future

developments should focus on refining AI's ability to process idiomatic meaning, contextual variation, and cultural adaptation, ensuring that translated content maintains both linguistic accuracy and communicative effectiveness.

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