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Evaluating the Linguistic Accuracy of AI Tools in decoding Idiomatic Expressions

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Abstract:

Idioms, being culturally bound linguistic units, pose significant difficulties in comprehending them, especially when linguistic structures differ between the source and target languages. This study investigates the precision of artificial intelligence (AI) tools in decoding idioms. It also examines whether the efficiency of AI translation tools (AITTs) differ in decoding idioms across the target language it translates into (Arabic into English or English into Arabic). Through a comprehensive analysis of 10 idiomatic expressions within their contexts to the translation by five AI tools, i.e., ChatGPT, QuillBot, Copy AI, Poe, and Gemini. The results of the study showed that there are potential problems in the process of decoding idioms from English into Arabic and vice versa. The finding showed that AITTs' level of proficiency differs. ChatGPT ranked first while QuillBot ranked last. Yet, their level of proficiency is still weak. The findings also showed that AITTs' level of proficiency is better when rendering from Arabic into English to translating form English into Arabic. This study contributes to the AITTs by providing insights into the capabilities of these tools for translation accuracy.

Keywords: Accuracy; AI translation tools (AITTs); idioms;

linguistic accuracy linguistic errors

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Introduction

Idioms are essential parts in every nation's cultural heritage (Abjalova & Sharipova, 2024) Translation them is considered a pivotal tool that enables people all over the world to share information, sciences, literature, news, culture, etc. (Bassnett, 2013). Nevertheless, translation is not an easy task, particularly the translation of idioms and culturally bound expressions, as their translation requires knowledge of both the languages and the cultures; furthermore, it requires knowledge of the proper strategies for rendering and conveying the intended meaning (Dweik & Thalji, 2016).

Idioms are an integral part of language; they conveying nuanced meanings that extend beyond the literal interpretation of words (Liontas, 2024). However, the translation of idiomatic expressions poses significant challenges, as the meaning of an idiom may not be directly translatable into another language due to cultural, historical, and linguistic differences. Despite advancements in machine translation and natural language processing, errors in the translation of idioms remain prevalent (Abjalova & Sharipova, 2024) and can significantly affect the quality and effectiveness of communication (Ahmed, 2022).

Translating idioms is not easy for translators since idioms are one of the language elements that rarely have an equivalent in other languages. Baker (2011) argues that idioms pose meanings that cannot be decode from their parts. Therefore, it is necessary to understand idioms, as the meanings make the idioms hard to translate.

Statement of the Problem

English and Arabic are two languages with distinct linguistic structures. These linguistic variations pose challenges for AI translation systems, as literal translations may not preserve the intended meaning or grammatical structure of the source text (AlAfnan, 2025; Metwally et al., 2024). The problem, however, is that despite recent developments in the field of translation theory and application, idiomatic expressions still pose a challenge for translators and foreign learners (Tergui, 2024). Previous studies checked the complexity of rendering idioms (Abjalova & Sharipova, 2024; Ahmed, 2022) for students and translation. No study according to us compared the rendering of idioms by various AITTs to check the level of accuracy among these AITTs. This makes the study at hand deserve investigation. Despite advancements in machine learning and natural language processing, current AI systems often struggle to accurately translate idiomatic expressions, leading to errors, misunderstandings, and loss of meaning in the translated text. This study set the following study questions:

1. How do existing AITTs perform in decoding idiomatic expressions between English and Arabic language pairs?
2. Is the translation efficiency of AITTs differ across diverse language pairs?

Literature Review

Translation to Newmark (1988) is the transferring of text meaning into another language in the way that the intended meaning is conveyed. One of the challenges in translation is rendering idioms across languages. Idioms pose unique challenges for translators due to their figurative meanings and cultural connotations. Literal translations often fail to capture the intended sense of idiomatic expressions, leading to inaccuracies and misunderstandings. Similarly, Baker (2011) highlights the necessity of comprehending both the figurative and literal meanings to convey the idiomatic expressions effectively.

Syntactic variations

Syntactic variations between languages further complicate the translation of idiomatic expressions. English is an analytic language with a relatively simple morphological structure, while Arabic is a Semitic language that employs complex morphology, diglossia, and a non-Latin script (Habash, 2010). Therefore, such variation in the two language structures impact the accuracy of processing the idiomatic translation (Munday, 2016). Furthermore, Ahmad (2018) also affirms that the challenges of translating idiomatic expressions is resulted due to the syntax differences between English and Arabic and often leadings to inconsistencies in translated texts. Furthermore, as Arabic possesses a rich inflectional and derivational system processes, presents challenges for AI translation systems like Neural Machine Translation (NMT), especially compared to English's simpler morphology (El-Kahlout & Habash, 2015). Additionally, English follows a rigid Subject-Verb-Object (SVO) structure, whereas Arabic allows flexible word orders, confusing AI systems trained on stricter syntactic patterns (Kholy & Habash, 2012). The lack of short vowels in written Arabic further complicates translations, as AI systems struggle to resolve lexical ambiguities (Tantawi, 2018).

Artificial intelligence translation tools

AI systems, particularly in low-resource languages like Arabic, typically fail to capture context, which is crucial for accurate translation (Shen et al., 2019). The advent of neural machine translation has brought significant improvements (Bin-Hady, 2023), but it is argued that NMT systems are still biased toward high-resource languages like English. This leads to discrepancies in translation quality when translating between Arabic and English, particularly in the case of Arabic dialects or less commonly used forms of the language (Alharbi & Lee, 2020). The literature review highlights the

multifaceted nature of idiomatic translation, encompassing the challenges related to syntax variations, cultural differences, and the limitations of AITTs. By analyzing the existing study in this field, we can gain valuable insights into the complexities of translating idiomatic expressions and identify strategies for improving translation accuracy in multilingual contexts.

Translating idioms

The rendering of idiomatic expressions encompasses various theoretical perspectives like equivalence and functional theories. Each offers unique backgrounds into the strategies required and the challenges raised. Equivalence theory, based on Nida and Taber's (1969) study, posits that translations should convey the same effect as the original text at the semantic and pragmatic levels. However, achieving equivalence for idioms often requires processing the language creatively to bridge the cultural and linguistic differences among the language pairs. Another approach, i.e., Functional approaches advocated by scholars such as Nord (1997) and Reiss (1971), gives priority to the communicative function of the target text, allowing more flexibility in the rendering of idiomatic expressions. Studyers like, Chiaro (2005) highlights the role of cultural context in processing the intertextual nature of translation for shaping the meaning of idiomatic expressions. She links the success in rendering idioms to the mastery of linguistic proficiency and deep understanding of cultural connotations and associations.

Recent studies have focused on evaluating the performance of AITTs in translating idiomatic expressions. AITTs, such as Google Translate and DeepL, have shown remarkable improvements over the years (Abjalova & Sharipova, 2024; Ahmed, 2022). However, the inherent linguistic variations between languages pose significant challenges for such AILTs. Abjalova and Sharipova (2024) stated that comprehending the meaning of idiomatic expression is important for both natural language processing and specialist in translation studies. The study posed some solutions for automatic translation to AITs. The study showcased the importance of modeling idioms for automatic translation. The study also underscored the issue resulted in rendering idioms using google translation, AI and Yandex translation. The study concluded by stating that importance of new applications for translation, they are challenging in translating idioms. Furthermore, Ahmed (2022) examined the impact of metacognitive awareness in rendering idiomatic expressions. The study used cognitive task analysis to measure the metacognitive awareness of translators and bilinguals to translate idioms. The findings indicate that translators lack metacognitive skills but they possess metacognitive awareness of the translation materials while bilinguals possess the metalinguistic skills to decode idiomatic expressions. Other studies have highlighted the challenges that AITTs face when dealing with Arabic–English

linguistic variations. Seyidov (2024) discusses the complexities of Arabic dialects and structures, noting that AI struggles with maintaining accuracy and cultural sensitivity. Omar and Salih (2024) emphasize the need for better training in post-editing for English–Arabic translation and reveal the gaps in AI integration within translation education. Another study points to the difficulties AI tools encounter with idiomatic expressions and contextual nuances between these languages.

Methods

A corpus approach is used in examining the accuracy of translation tools in translating idioms linguistically, a systematic methodology is crucial. Firstly, a diverse choice of idioms from the source language should be collected, ensuring a range of complexities and structures to represent the breadth of idiomatic expressions. These idioms serve as the basis for the evaluation. The researchers chose these various idioms to show the capabilities of AITTs when translating between English and Arabic. English idioms can be misinterpreted if taken literally, while Arabic idioms often reflect cultural wisdom that does not translate directly. These examples highlight the difficulties involved in translating metaphorical language and cultural context. As mentioned, the study is a corpus based, not time or place is applicable to this research type. The study took place in Jan, 2025.

Data inclusion and AITTs

The study built a corpus of ten idioms. Five are Arabic idioms and translated into English. The corpus also includes five English idioms translated into Arabic using AITTs. The researchers selected five translation tools to translate these ten idiomatic expressions. the AITTs include ChatGPT, QuillBot, Copy AI, Poe, and Gemini. These tools are utilized to translate the selected idioms into a target language. The researchers selected them for their unique strengths in translating idioms. ChatGPT excels in understanding complex language, QuillBot is good at paraphrasing idioms, and Copy AI adapts well to context. Poe offers advanced language generation capabilities, while Gemini provides strong contextual understanding. Using these tools together allows a thorough evaluation of the effectiveness of the different AI systems in handling idiomatic expressions.

The translation process involves inputting each chosen idiom into the selected tools and ensuring that the context is provided so that accurate meanings can be captured. Writing down the translated outputs allows a consistent evaluation and direct comparison of how each tool handles the idioms. This approach highlights the variations and potential issues involved in translating idiomatic expressions.

To evaluate translation accuracy, criteria such as syntactical correctness, semantic equivalence, and preservation of idiomatic expression are established. Syntactical correctness checks for proper

grammar and structure; semantic equivalence ensures the meaning matches the original idiom; and preservation of idiomatic expression assesses whether the idiomatic flavor and cultural nuances are maintained. These criteria help to identify errors, such as grammatical mistakes, loss of meaning, or inappropriate translations of idiomatic phrases.

Data analysis involves analyzing the evaluation results to determine the overall accuracy of the translation tools in handling idiomatic expressions linguistically. This analysis identifies the errors in each translation of each tool, providing valuable insights into its performance. The idioms were analyzed according to three scores. If the AITTs successfully render the semantic and metaphorical meaning, 2 is given to the rendering. If the AITTs convey the semantic meaning without the metaphorical meaning, 1 is given to such a rendering. If the rendering does not covey the semantic and the metaphorical meaning, 0 is given to such a rendering. The total for each of the AITTs were calculated in each language pair. This was aimed to show the AITTs capabilities in each language pair. The total of teach AITTs was calculated across the ten idioms to evaluate the capabilities of each AITTs.

Results

1. How do existing AITTs perform in decoding idiomatic expressions between English and Arabic language pairs?

Answering this question requires displaying the findings of the AITTs while translating the ten selected idioms. The researchers start by displaying the rendering of English idioms into Arabic.

Translation from English into Arabic

Table 1. You really hit the nail on the head with this analysis.

Idiom	AITs	The Translation	The Correct Translation
1. You really hit the nail on the head with this analysis.	ChatGPT	لقد أصبت كبد الحقيقة بتحليلك هذا	أصاب كبد الحقيقة
	Poe	لقد أصبت في العين مع هذا التحليل	
	Gemini	أصبتَ المسمار على الرأس في هذا التحليل	
	QuillBot	أنت حقاً ضربت المسمار على الرأس بهذا التحليل	
	Copy AI	لقد وجهت الضربة بدقة بتلك التحليل	

The idiom no 1 is an expression in English, meaning that someone's analysis is accurate or precise. It is rendered into (أصاب كبد الحقيقة). Checking the AITTs to rendering this idiom, it can be seen that ChatGPT provides the most efficient translation into Arabic as (لقد أصبت كبد الحقيقة بتحليلك هذا). Such a rendering captures a similar sentiment. This translation preserves the essence of the idiomatic expression in English, maintaining both the metaphor and the compliment about the analysis being accurate. The translation is correct and contextually appropriate. The QuillBot, Poe, and Gemini translations are literal translations of the English idioms; they do not fit naturally in Arabic. Furthermore, the Copy AI's translation (لقد وجهت الضربة بدقة بتلك التحليل), conveys accuracy but lacks the idiomatic nuance of the original English phrase (Table 1).

Table 2. Be careful, all flesh is not venison

Idiom	AITTs	The Translation	The Correct Translation
2. Be careful, all flesh is not venison	ChatGPT	احذر، ليس كل لحم هو لحم الغزال	ليس كل ما يلمع ذهبًا
	Poe	كن حذرًا، كل لحم ليس غزالًا	
	Gemini	كن حذرًا، ليس كل لحم غزال	
	QuillBot	كونوا حذرين، كل شيء ليس بلحم	
	Copy AI	كن حذرًا، ليس كل لحم يعتبر لحم غزال	

While analyzing the translations produced by different AITTs, common errors in understanding the idiomatic expressions were found. For example, the phrase "Be careful, all flesh is not venison" is a metaphor that warns against being deceived by appearances. A literal translation into Arabic keeps the direct meaning but loses the metaphorical depth. The correct Arabic equivalent (ليس كل مايلمع ذهبا) dates back to the play *The Merchant of Venice* by William Shakespeare in the sixteenth century. Examining the rendering of the AITTs (Table 2) revealed that all the five AITTs failed to capture even the functional meaning of the idiom.

Table 3. If you want to impress your boss, go the extra mile, and finish the report early

Idiom	AITTs	The Translation	The Correct Translation
3. If you want to impress your boss, go the extra mile, and finish the report early.	ChatGPT	إذا كنت تريد أن تبهر رئيسك، ابذل جهدًا إضافيًا وأنهِ التقرير مبكرًا.	يبذل جهدًا إضافي
	Poe	إذا كنت تريد أن تبهر مديرك، فاذهب إلى أبعد من ذلك، وأنجز التقرير مبكرًا	
	Gemini	إذا كنت تريد أن تترك انطباعًا جيدًا على رئيسك، بذل جهدًا إضافيًا وأنهِ التقرير مبكرً	
	QuillBot	إذا أردت أن تبهر رئيسك فاذهب	

	للميل الإضافي وأنهي التقرير مبكرا
Copy AI	إذا أردت إثارة إعجاب رئيسك، اجتهد أكثر وانهي التقرير مبكرًا.

The idiom no 3 above highlights the value of extra effort. The ChatGPT and Gemini translations accurately convey this meaning in Arabic. By using ابذل جهداً إضافياً instead of a direct translation of the idiom, the translation remains natural and effectively communicates the original message. This idiom encourages a person to exert extra effort if they wish to stand out. The QuillBot and Poe translations are direct but awkward in Arabic, as the idiom does not naturally fit. The correct translation, ابذل جهداً إضافياً better conveys the idea in a way that resonates with Arabic speakers, emphasizing the importance of exerting more effort to achieve success. Copy AI's translation, اجتهد أكثر (work harder), conveys only the general idea. The correct translation ابذل جهداً إضافياً more accurately reflects the original intent, emphasizing the importance of going above and beyond expectations rather than just working harder.

Table 4. When you remove an old tree, and it will wither to death

Idiom	**AITTs**	**The Translation**	**The Correct Translation**
4. He tried to change his colleague's habits, but when you remove an old tree, and it will wither to death	ChatGPT	حاول تغيير عادات زميله، ولكن عندما حاول ذلك، أصبح واضحًا أن إزالة شجرة قديمة ستؤدي إلى ذبولها وموتها.	الطبع يغلب التطبع
	Poe	لقد حاول تغيير عادات زميله، لكن عندما قطعت شجرة قديمة، ستذبل حتى الموت	
	Gemini	حاول تغيير عادات زميله، ولكن عندما أزال الشجرة القديمة، كان واضحًا أنها ستذبل وتموت	
	QuillBot	حاول تغيير عادات زميله، ولكن عندما كنت فقط كان من الواضح أن إزالة شجرة قديمة، وأنها سوف تذبل حتى الموت	
	Copy AI	حاول تغيير عادات زميله، ولكن عندما حاول ذلك، أصبح واضحًا أنه من الصعب إزالة شجرة قديمة، وسوف تموت.	

In idiom no 4, the literal translations by ChatGPT, QuillBot, Poe, Gemini, and Copy AI do not convey the desired meaning because of the lack of terminological knowledge. On the other hand, the precise translation, " الطبع يغلب التطبع" has been taken from the poem الطبع يغلب التطبع by Ahmed Ali Suleiman Abdel Rahim accurately conveys the meaning of the original idiom and highlights how difficult it is to modify the innate characteristics of the Arabic language. There AITTs comment grammatical errors and basically depended on literal translations which showed their inability to

understand terminology. Because they choose the wrong words, they are unable to convey the required message well and accurately.

Table 5. A nod for a wise man and a rod for a fool

Idiom	AITTs	The Translation	The Correct Translation
5. The mentor gave a nod of approval to the skilled apprentice, while the unprepared novice faced a reprimand. This perfectly captured "A nod for a wise man and a rod for a fool."	ChatGPT	المرشد أعطى إشارة موافقة للتلميذ الماهر، بينما واجه المبتدئ غير المستعد تأنيباً. هذا يعبر تماماً عن "إشارة للرجل الحكيم وعصا للأحمق	اللبيب بالإشارة يفهم
	Poe	أشار المرشد بالموافقة إلى المتدرب الماهر، بينما واجه المبتدئ غير المستعد توبيخًا. وهذا يلخص تمامًا " إشارة للرجل الحكيم وعصا للحمق".	
	Gemini	أعطى المرشد إشارة بالقبول للتلميذ الماهر، بينما واجه المبتدئ غير المستعد توبيخًا. هذا يصف تمامًا " إشارة بالقبول للحكيم وعصا للتافه".	
	QuillBot	وأعطى المعلم إيماءة بالموافقة للمتدرب الماهر، في حين واجه المبتدئ غير المستعد توبيخاً. هذا مثالى أشارة''لرجل حكيم وقضيب لأحمق "	
	Copy AI	أعطى الإرشاد موافقة بإيماءة للمتدرب الماهر، بينما واجه النافذ غير المستعد انتقادًا. هذا يلخص تمامًا "إيماءة للرجل الحكيم وعصا للأحمق	

ChatGPT, QuillBot, Poe, Gemini, and Copy AI use the literal translations method to render idiom no 5; they do not decode the exact meaning of the idiom; so they fail to deliver the intended message correctly and accurately. The correct translation, اللبيب بالإشارة يفهم , conveys the meaning correctly in Arabic which shows that an intelligent person can understand faster, whereas someone less intelligent needs more direct explanations. The Arabic expression (إن اللبيب من الإشارة يفهم) is a verse mentioned in a poem by Marouf bin Abdul-Ghani Al-Rusafi. In the following instances, the researchers provide the translation of Arabic idioms into English.

Translation from Arabic into English

Table 6. Add insult to injury

Idiom	AITTs	The Translation	The Correct Translation
6. عندما حاولت إصلاح المشكلة، زادت الأمور سوءاً وبدأت تزيد الطين بله.	ChatGPT	When I tried to fix the problem, things got worse, and it only made matters worse.	Add insult to injury.
	Poe	When I tried to fix the problem, things got worse and started to make the situation even muddier.	
	Gemini	When I tried to fix the problem, things got worse, and the situation went from bad to worse.	
	QuillBot	When I tried to fix the problem, things got worse, and it got worse	
	Copy AI	When I tried to fix the problem, things got worse and the situation started going from bad to worse.	

In idiom no 6, ChatGPT, QuillBot, Gemini, and Copy AI provided us with a functional translation; they caught the intended meaning however, they could not get the metaphorical effect on the reader. On the contrary, Poe failed to produce the functional meaning due to its fully dependence on to literal translation that failed to capture the idiomatic meaning of the idiom. The fault is perceived in adding the expression " the situation even muddier" which is a very literal and incorrect equivalence to the Arabic expression تزيد الطين بله . This type of error is known as a semantic error, where the meaning of the original idiom is not conveyed accurately and clearly in the translated text.

Table 7. Better safe than sorry

Idiom	AITTs	The Translation	The Correct Translation
7. عندما رأى السيارة القادمة بسرعة، توقف فجأة لأن من خاف سلم.	ChatGPT	When he saw the car coming quickly, he stopped suddenly because those who are cautious stay safe.	Better safe than sorry
	Poe	When he saw the approaching car at high speed, he stopped suddenly because those who are	

		afraid submit.
	Gemini	When he saw the car coming at high speed, he stopped suddenly because he who fears is safe
	QuillBot	When he saw the car coming fast, he suddenly stopped because the one who feared a ladder
	Copy AI	When the car approaching quickly, it suddenly stopped because he who fears will yield.

The translations provided by ChatGPT and Gemini for idiom no 7 convey the function meaning intended in the idioms as " who are cautious stay safe", and "he who fears is safe". On the contrary, QuillBot, Poe, and Copy AI could not provide the meaning. Their suggested translation were literal translations of the words; they do not succeed even to select the conntative meaning of the words provided in the idiom. The exact meaning of the original idiom,من خاف سلم is "Better safe than sorry", and it conveys to us the idea of taking the necessary precautions to avoid regret or potential harm. All these errors are classified as semantic errors as they do not convey the intended meaning accurately.

Table 8. Abundance like want ruins many

Idiom	**AITTs**	**The Translation**	**The Correct Translation**
8. إن البطر يعمي النظر، فرغم تحذيرات الأصدقاء، استمر في صرف الأموال بشكل مفرط	ChatGPT	Despite his friends' warnings, he continued to spend money extravagantly, but excess can blind one's judgment.	Abundance like want ruins many.
	Poe	Arrogance blinds the sight, and despite warnings from friends, he continued to spend money excessively.	
	Gemini	Arrogance blinds one's sight. Despite his friends' warnings, he continued to spend money excessively	
	QuillBot	The duck's blinding, and despite friends' warnings, he kept spending too much money.	
	Copy AI	Indeed, stubbornness blinds one's vision, as despite warnings from friends, he continued to excessively spend money.	

The translations by ChatGPT, Gemini, Poe, and Copy AI convey the functional meaning of the Arabic idiom,البطر يعمي النظر (Table 8) to some extent; however, they not accurately convey the metaphorical effect intended. The correct translation, “Abundance like want ruins many,” indicates that having too much abundance can lead to negative outcomes. QuillBot on the contrary, mistranslated the idiomatic expression providing nonsense translation as "The duck’s blinding". This discrepancy highlights a semantic error in the translation.

Table 9. Talk of an angel and you will hear his wings

Idiom	AITTs	The Translation	The Correct Translation
9. ومن منطلق تفاءلوا بالخير تجدوه، تمسكنا بالأمل في كل تحد واجهناه	ChatGPT	Based on the saying “Be optimistic and you will find goodness,” we held on to hope in every challenge we faced.	Talk of an angel and you will hear his wings
	Poe	From the premise of being optimistic about good, you will find it, we clung to hope in every challenge we faced.	
	Gemini	Based on the principle of being optimistic, we held onto hope in every challenge we faced.	
	QuillBot	And in the spirit of optimism, you find him, we hold on to hope in every challenge we have faced.	
	Copy AI	From a perspective of optimism, you will find goodness. We held onto hope with every challenge we faced.	

Like to idiom no 8, the ChatGPT, Poe, Gemini, and Copy AITTs provide the functional meaning of the idioms where the rendering can be understood. However, they do not exactly match the original Arabic idiom تفاءلوا بالخير تجدوه. . While they convey positive feelings, they misidentify the specific metaphorical meaning. On the contrary, QuillBot could not provide the literal meaning. It provided nosense translation as "And in the spirit of optimism, you find him". The correct translation, ‘talk of an angel and you will hear his wings’ indicates that speaking positively about something can lead to its

achievement. This discrepancy highlights a semantic error in the translation, whereby the intended metaphorical meaning is not fully conveyed in English.

Table 10. A chip off an old block

Idiom	AITTs	The Translation	The Correct Translation
10. لقد أظهر ابن المدير نفس مهارات القيادة المميزة التي كان يمتلكها والده، فهذا الشبل من ذاك الأسد.	ChatGPT	His son displayed the same exceptional leadership skills as his father, showing that the apple does not fall far from the tree.	A chip off an old block. Like father, like son.
	Poe	The director's son displayed the same distinctive driving skills that his father possessed, for this cub is from that lion.	
	Gemini	The director's son has shown the same exceptional leadership skills that his father possessed. Like father, like son.	
	QuillBot	The boss's son showed the same special driving skills his father had, this cub from that lion.	
	Copy AI	The manager's son displayed the same exceptional leadership skills as his father, for this young cub is from that lion.	

Rendering for idiom 10 is shown (Table 10). The translation by the Gemini AI is accurate and keeps the meaning clear. It shows that the son's abilities are like his father's, just like the proverb suggests. ChatGPT also provided creative translation keeping the metaphorical meaning. The Arabic idiom هذا الشبل من ذاك الأسد refers to someone inheriting characteristics from their parents. The correct translation, "A chip off an old block ', 'like father like son or 'apple does not fall far from the tree", effectively expresses this concept. On the contrary, Poe, QuillBot and Copy AI could not figure out even the semantic meaning of the idiom providing literal translation " this cub from that lion". They also could not convey the meaning of the word ""قيادة in this text which refers to "leadership not to driving. Table 11 also shows that the level of proficiency of these AITTs is still weak generally. ChatGPT comes in the first rank with 10 out of 20 followed by Gemini which scored 8 out of 20. Copy AI got the third rank among the AITTs scored 5 out of 20 while Poe mounted 3 out of 20. Finally, QuillBot received the last rank achieving 2 out of 20.

2. Is the translation efficiency of AITTs differ across diverse language pairs?

Table 11. AITTs in rendering idioms across languages

Language	AITTs/ Idiom no	ChatGPT	Poe	Gemini	QuillBot	Copy AI
English into Arabic	1.	2	0	0	0	1
	2.	0	0	0	0	0
	3.	2	1	2	1	1
	4.	0	0	0	0	0
	5.	0	0	0	0	0
	Total	4	1	2	1	2
Arabic to English	6.	1	0	1	1	1
	7.	1	0	1	0	0
	8.	1	1	1	0	1
	9.	1	1	1	0	1
	10.	2	0	2	0	0
	Total	6	2	6	1	3
AITTs across the two languages		10	3	8	2	5

Table 11 showed that the AITTs provide different level of translation based on the target language. Figure 1 indicates that AITTs have shown a little efficiency in translating from Arabic into English than in English to Arabic. For instance, ChatGPT scored 6 out of 10 in rendering idioms from Arabic into English while it scored 4 out of 10 in rendering from English into Arabic. Gemini also scored 6 out of 10 in rendering idioms from Arabic into English and scored just 2 out of 10 when rendering idioms from English into Arabic. Copy AI achieved 3 in rendering Arabic idioms into English. The efficiency level decreased into 2 when rendering from English into Arabic. Poe got 2 in translation Arabic idioms into English and 1 in the rendering of idioms from English into Arabic. Finally, Quillbot scored the same with 1 out of 10 in both translations.

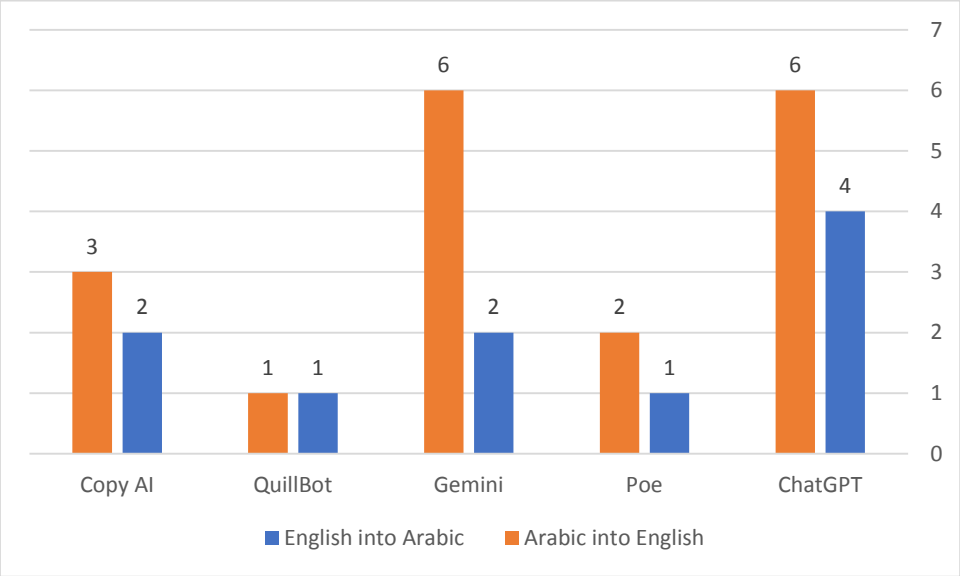

Figure 1. AITTs in rendering idioms across languages

Discussion

After the analysis of the ability of AITTs to accurately translate idiomatic expressions using context, it is obvious that the weakness in the accuracy of AITTs in understanding the idiomatic meaning of English and Arabic phrases is related to sematic challenge, imprecise word choices, cultural differences, and poor understanding of the structure and linguistic context of the idiom. The results of the current study are in accordance with Chiaro's (2005) assertion that the successful idiom translation requires a deep understanding of cultural connotations and associations. These findings agree with Ahmad (2018) who pointed out that the grammatical differences between English and Arabic languages led to errors and contradictions in the translated texts. The findings also are supported by Metwally et al. (2024) who showed that AI tools could not figure out the intention meaning and selected superficial sentence structure.

The study also found out that AITTs achieved a little bit better rendering of idioms from Arabic into English. This affirms that such AITTs are trained more on English corpus than Arabic. This finding aligned with the findings of Shen et al. (2019) and Alharbi and Lee (2020) who emphasizing that NMT systems are biased towards high-resource languages like English, which often results in lower translation quality for Arabic. Shen's focus on low-resource language challenges and Alharbi's analysis of NMT's limitations in handling Arabic dialects are particularly relevant. Both studies highlight the need for better data and system improvements to bridge these disparities, reinforcing the issues I observed in Arabic-English translation accuracy. These findings call the necessity of training the AI tools on large Arabic corpus which helps such tools in generating more accurate content in Arabic as well rendering into Arabic better than the what they do in the current time.

Conclusion

The researchers examined the AITTs when translating five specific idiomatic expressions between English and Arabic. They identified that these linguistic variations were primarily related to semantics, morphology, and syntax. Notably, the researchers observed a significant disparity in the precision of the AI translations, with the translations from English to Arabic demonstrating lower accuracy compared to those from Arabic to English. This disparity highlights the unique linguistic features of Arabic, such as its intricate morphology, complex syntax, and rich semantics, which present greater challenges for AI translation systems. Moreover, the study revealed that certain linguistic elements, particularly idiomatic expressions, and cultural nuances, are frequently lost or mistranslated, especially in the English-to-Arabic direction. The analysis also pointed to specific variations, such as the reliance on literal translation and cultural differences, as key factors affecting translation accuracy. For example, literal translations often resulted in semantic errors, while cultural disparities between English and Arabic further contributed to inaccuracies. Overall, the findings emphasize the critical need to account for linguistic differences between the two languages in the development of AITTs, and they offer valuable insights into the challenges involved in achieving cross-linguistic translation precision.

Continued studies promote further investigation into specific linguistic phenomena, such as morphological complexity, word order variations, dialect, and poetry, which cause difficulties for AITTs in English and Arabic. Cooperation between computer scientists, linguists, and translation specialists is encouraged to develop hybrid approaches that leverage both linguistic knowledge and machine learning techniques to increase translation accuracy. Experts in the Arabic language need to be involved during the process of programming the AI tools. By putting these recommendations into practice, AITTs may be improved and optimized to handle linguistic variations in both English and Arabic more effectively; this would improve the understanding and communication between people from different cultures. Further studies are needed to explore innovative approaches and technologies that address the inherent challenges of idiomatic translation, facilitating more correct and culturally sensitive communication across languages.

المستخلص

تقييم الدقة اللغوية لأدوات الذكاء الاصطناعي في فهم التعبيرات الاصطلاحية

عائشة المنيعي

غدي الشهراني

تُعتبر التعبيرات الاصطلاحية وحدات لغوية مرتبطة ثقافيًا باللغة، لذا ففهم هذه التعبيرات تضع المترجم بين صعوبات كبيرة في الترجمة خاصة عندما تختلف التراكيب النحوية بين اللغتين المصدر والهدف. تتناول هذه الدراسة التعرف على دقة أدوات الترجمة المعتمدة على الذكاء الاصطناعي في تفسير التعابير الاصطلاحية. كما تستكشف ما إذا كانت كفاءة أدوات الترجمة المعتمدة على الذكاء الاصطناعي تختلف في نقل التعابير الاصطلاحية وفقا لاختلاف الزوج اللغوي (إنجليزي – عربي، أو عربي -إنجليزي). ومن خلال تحليل شامل لعشر تعابير اصطلاحية تم ترجمتها بواسطة خمس أدوات ذكاء اصطناعي ضمن سياقاتها وهي: ChatGPT وQuillBot وCopy AI وPoe وGemini. أظهرت نتائج الدراسة وجود مشكلات في ترجمة التعابير الاصطلاحية من الإنجليزية إلى العربية والعكس. وأظهرت النتائج أن مستوى كفاءة أدوات الترجمة المعتمدة على الذكاء الاصطناعي يختلف، حيث احتل ChatGPT المرتبة الأولى بينما جاء QuillBot في المرتبة الأخيرة. ومع ذلك، لا يزال مستوى كفاءتها ضعيفًا. كما أظهرت النتائج أن مستوى كفاءة أدوات الترجمة أفضل عند الترجمة من العربية إلى الإنجليزية مقارنةً بالترجمة من الإنجليزية إلى العربية التي كانت كفاءتها ضعيفة. يساهم هذه البحث في تحسين أدوات الترجمة المعتمدة على الذكاء الاصطناعي من خلال تقديم رؤى حول قدرات هذه الأدوات في دقة الترجمة.

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