AI-Driven Analysis of Modality in the English Translation of the Iraqi Constitution

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Abstract

This paper investigates the use of artificial intelligence in the analysis of the translation of different forms of modality in legal texts from Arabic into English . It hypothesizes that artificial intelligence is helpful in determining the cases of modality and their renditions so that these renditions will be easily assessed in terms of achieving the same legal effect. The research aims to identify and classify lexical items referring to modality used in the Iraqi constitution and to analyse the English rendition by the United Nations' Office for Constitutional Support to see whether the translated version retains the original's intended legal force or not. It examines patterns of equivalence, shifts, and the potential loss of meaning during translation. The study concludes that despite the fact that artificial intelligence can be used to identify expressions indicating modality in Arabic legal texts and their equivalent forms in English, still there is a need for human post editing of these analyses to reach solid results .

تحليل الوجهية المعتمد على الذكاء الاصطناعي في الترجمة الإنجليزية للدستور العراقي

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المستخلص

يتناول هذا البحث دراسة استخدام الذكاء الاصطناعي في تحليل ترجمة أشكال مختلفة من صيغ الوجهية في النصوص القانونية من العربية إلى الإنجليزية حيث يفترض أن الذكاء الاصطناعي مفيد في تحديد اشكال هذه الصيغ وترجماتها بحيث يمكن تقييم هذه الترجمات بسهولة من حيث تحقيق نفس الأثر القانوني. ويهدف البحث إلى تحديد وتصنيف العناصر اللغوية التي تشير إلى الوجهية في الدستور العراقي وتحليل الترجمة الإنجليزية التي أجراها مكتب الدعم الدستوري التابع للأمم المتحدة لمعرفة فيما إذا كانت النسخة المترجمة تحتفظ بالقوة القانونية المقصودة للأصل أم لا، ويدرس أنماط التكافؤ والتحولات واحتمال فقدان المعنى أثناء الترجمة. وتخلص الدراسة إلى نتيجة مفادها بأن استخدام الذكاء الاصطناعي لتحديد التعبيرات التي تشير إلى الصيغ في النصوص القانونية العربية وأشكالها المعادلة في اللغة الإنجليزية، الا انه لا تزال هناك حاجة إلى التحرير البشري اللاحق لهذه التحليلات للوصول إلى نتائج راسخة.

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الكلمات المفتاحية : الذكاء الاصطناعي، النصوص القانونية، التحول، الترجمة .

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Introduction

The translation of modality in legal text is very important because any change in the modality would change the legal effect of the related text. Therefore, translators should be careful in handling different forms of modality when they translate legal texts. The importance of presenting an appropriate translation of modality increases more in case of translating constitutions. The following theoretical part gives a brief account of the basic concepts of the research including modality, and the role of AI in translation analysis. It also presents a brief account of related previous studies whether those related to legal translation or the use of AI in translation studies.

The Role of AI in Translation

Recently , the need for the use of Artificial intelligence (AI) in   translation highly increased due to the great amount of tests (Devlin et al. 2019). Translators   currently use Google Translate and DeepL , to process context and generate fluent, near-human translations (Wu et al., 2016). AI improves efficiency by automating large-scale text processing and minimizing errors in multilingual datasets. However, despite the fact that AI applications are continuously developed , challenges remain, especially in the translation of figurative language (Bender et al., 2021).   Artificial intelligence has transformed linguistics and translation research by enabling advanced natural language processing (NLP). In linguistics, AI-powered tools analyze large corpora to identify syntactic patterns, semantic relationships, and sociolinguistic differences. Transformers, for example, are machine learning models that automate morphological and phonological analysis, which increases research efficiency. In translation research, neural machine translation (NMT) systems such as Google Translate and DeepL use deep learning to produce contextually accurate translations, but dealing with low-resource languages and cultural nuances remains challenging (Way, 2020).

AI also aids in post-editing, terminology extraction, and quality assessment, streamlining professional translation workflows (Kenny, 2022). However, ethical concerns about bias in training data and the displacement of human translators remain (Bender et al., 2021).   Despite these challenges, artificial intelligence (AI) continues to transform linguistic research and translation practices, providing unprecedented scalability and accuracy.

Legal Translation of Arabic Documents

The massive majority of research on the legal translation of Arabic documents has concentrated on the linguistic and cultural challenges posed by differences between Arabic and the target language, specifically English. According to Hussain (2018), translating Islamic legal terms (such as Sharia and Waqf) is challenging due to their distinct conceptual foundations . Scholars emphasize the importance of functional equivalence in preserving legal precision while accommodating cultural differences (Alwazna, 2021).Comparative analyses of Arabic legal texts reveal syntactic and terminological issues, such as the translation of passive constructions and modality markers (Farghal, 2012). Furthermore, the research emphasizes the significance of translator expertise in dealing with the hybrid nature of legal Arabic, which combines classical and modern linguistic elements (Hatim, 2014;Hatim, & Munday, J. (2019)).

Recent advances in machine translation have been investigated, but limitations remain when dealing with context-dependent legal meanings (Sawalha and Atwell, 2020). These studies highlight the value of specialized training and standardized glossaries in improving the accuracy of Arabic legal translations.

Modality

In linguistics , modality refers to the speaker's attitude toward the proposition. It is used to express possibility, necessity, permission, and obligation. These are usually conveyed using modal verbs (e.g., must, may, should) or other linguistic devices to express whether the proposition is possible, necessary, desirable, or uncertain.

There are many types of modality. Epistemic Modality which refers to the speaker's judgment of truth or degree of certainty about a statement and deontic modality which expresses what ought to be ,actions that are permitted, required, or forbidden according to some authority (law, morals, rules, etc.). It covers Obligation / Necessity → what must be done, Permission → what may be done, Prohibition → what must not be done. So both necessity and obligation are subtypes of deontic modality. (Palmer ,2013).

Modality in Legal Language

Modality is important in legal texts because it shapes the obligation included in the text and other dimensions of language, which influence how laws, contracts, and judicial decisions are interpreted (Biber et al., 2021). Legal texts frequently use many modality expressions . The most frequent are the verbs of *shall* and *must* to impose binding obligations. As for optional acts , lower-modality terms such as *may* and *could* are usually used . This linguistic feature ensures that legal communications are correct, authoritative, and enforceable. According to Halliday & Matthiessen, (2014) , modality reflects power dynamics because legislative judicial authorities use it to prescribe or permit actions . Understanding modality in legal texts is critical for legal translators to determine normative intent and resolve ambiguities.

Expressing Possibility

In Arabic, possibility is often realized by verbal or non-verbal items, including particles and specific structures that convey likelihood or uncertainty. The most common expressions include the particle قد (may/might), with the imperfect المضارع to express possibility, e.g., "قد ينجح الطالب "The student may succeed." Another structure uses من الممكن أن (it is possible that) or ربما (perhaps), such as من الممكن أن يسافر غداً "It is possible that he will travel tomorrow." Context and tone also play a role, and lexical items like قد يكون (it may be) or ربما يكون (it might be) allow speakers to grade the degree of possibility (Wright,1967). As for English, the modality of possibility is typically conveyed using modal verbs like (may, might, can, and, on occasion, could). The most common and significant of these is "may," which is frequently used to grant or indicate the existence of a legal option. For example, "A party may apply to the court" means that the action is legal but imposes no obligations. "Can" is sometimes used to indicate a factual or practical possibility (for example, "A contract can be terminated under certain conditions"), but it is less common in legislative drafting, where precision is required. " Might and could" are rarely used in formal statutes, but they do appear in judicial reasoning and secondary legal texts, usually to indicate hypothetical or conditional possibilities. Importantly, legal drafters frequently use the term "may" to differentiate between possibility or discretion and obligation "shall" or prohibition. Thus, expressions of possibility in legal English are critical in defining the scope of rights, permissions, and powers in legal texts. (Palmer, 2013)

Expressing Obligation

Obligation in Arabic is conveyed through a range of mandative expressions . The most direct form uses يجب أن (must/should), as in يجب أن يدرسَ جيداً "He must study well." Another strong expression is لابدّ من followed by a noun or لابدّ أن followed by a verb, indicating necessity or inevitability. Example: لابدّ أن يلتزم بالقوانين "He must comply with the laws." Softer moral or social obligation can also be expressed with من الواجب أن (it is necessary/one ought to) and the imperative form, depending on context and formality.Wright(1967). On the other hand, in legal English, obligation is primarily expressed using modal verbs and formulaic constructions that impose duties or responsibilities. The most commonly used markers are "shall" and "must". The standard modal in legislative drafting to impose binding obligations

has traditionally been shall (e.g., "The tenant shall pay rent on the first day of each month"). However, because shall can also indicate future, modern drafting guidelines favor must, which clearly conveys mandatory obligation (e.g., "The applicant must file the appeal within 30 days").Other expressions of obligation include phrases like is obliged to, is required to, or has a duty to, which express mandatory duties without the use of modal verbs. In contrast, the absence of such markers or the use of permissive modals such as "may" usually indicate discretion rather than obligation. Thus, clear linguistic choices in expressing obligation are critical to avoiding ambiguity and ensuring enforceability in legal documents (Farghal,2012).

Expressing Permission

Permission in Arabic is typically expressed using forms like يمكنك أن (you can/you are allowed to), e.g., يمكنك أن تدخل "You may enter." Another common phrase is يسمح لـ... بـ (to allow someone to do something), such as يسمح للطلاب بالحديث "Students are allowed to speak." In formal contexts, speakers may also use مسموح بـ followed by a verbal noun or noun phrase, e.g., مسموح بالتصوير هنا "Photography is allowed here." Polite requests or granting permission may appear in forms like هل يمكنني...؟ "May I…?" showing social nuance in expressing permission (Wright,1967). Whereas, in legal English, permission is most commonly expressed with the modal verb may, which indicates that an action is legally permissible but not required. For example, "A party may appeal the decision" expresses the right to act without imposing an obligation. This distinguishes "may" from "shall" or "must", which express obligation, and shall not or may not, which denote prohibition. In some cases, "can "is used to convey permission, but it is more commonly used to denote ability or possibility. Legal drafters prefer "may" because of its long history in legislative and contractual language for conferring rights, powers, or authorizations. Additional formulaic expressions, such as entitled to, permitted to, or has the right to, are also used to express permissions, particularly in statutes and contracts. These linguistic markers of permission are critical for defining the scope of legal rights and discretionary powers within legal frameworks. (Alwazna, 2021)

Model of Analysis

This paper focuses on using AI to perform the analysis of the linguistic realizations of modality in The Iraqi constitution and their English renditions. The basic principles of Catford's linguistic model of translation (1965) has been fed to AI to be used to identify and analyse the lexical items used to express modality in the source language and to identify cases of shifts in the selected items, viz., the Iraqi constitution in this case, and to specify their equivalent forms in the target language, viz., the English version .The analysis includes identifying the related item and then specifying the construction used for each type of modality. Then, determining the type of equivalent used in translation whether formal correspondence of textual equivalence. In this model, translation shift happens when the translator departs from formal correspondence for the sake of textual equivalence. Types of shift include level shift and category shift, which in turn includes structure, unit, class, intersystem shift.

Data analysis

The tables below show the analysis of selected samples from the Iraqi constitution, along with their English translation by the United Nations' Office for Constitutional Support. The selection of these samples was based on covering all cases of modality, and at the same time avoiding repetition as much as possible. The analysis includes cases representing four types of modality: possibility, permission, obligation and entitlements.

Table (1): Analysis of Expressing Permission in the Iraqi Constitution and its English Renditions

Article	SL Item	SL	TL	TL	Type of	Type of

No.		Realization		Realization	Shift	translation
رابعا/18	يجوز تعدد الجنسية العراقي للعراقي	V	'**may hold** multiple nationalities' — Art.18(3)	(modal+V)	Unit shift	Textual eq.
41	العراقيون **احرارٌ** في الالتزام باحوالهم الشخصية	Adj	'Iraqis are **free** in their personal status' — Art.41	Adj	No shift	Formal Correspondence
43	**للعراقي** حرية التنقل والسفر والسكن داخل العراق وخارجه	Preposition+ N	'Iraqis are **free** to practice religious rites' — Art.43	Adj	Class shift	Textual eq.

Discussion

Table (1) shows that expressions of permission are typically realized through different classes including verbs like يجوز   which has been generally rendered into (may).Nouns like احرار,حرية   may also, according to AI, be used as indicators of permission such as في الحرية مواطن لكل .... as indicators of permission; this analysis needs human intervention. The correction is that permission is expressed in the use of the preposition (لام) .

Table (2): Analysis of Expressing Obligation in the Iraqi Constitution and its English Renditions

Article No.	SL Item	SL Realization	TL	TL Realization	shift	Type of translation
أولاً/4	**يضمن** هذا الدستور الحفاظ على	V	This Constitution **guarantees** the Islamic identity of	V	No shift	Formal correspondence

	الهوية الاسلامية		the majority of the Iraqi people— Art.4(1)			
7	**تلتزم** الدولة بمحاربة الارهاب بجميع اشكاله	V	The State **shall undertake** combating terrorism in all its forms— Art.7	(modal + verb)	Unit shift	Textual eq.
9/1	**وتخضع** لقيادة السلطة المدنية	V(active)	**'shall be subject** to civilian control' — Art.9(1)	(modal + verb)(passive)	Unit shift+ structure shift	Textual eq.
13	ويكون **ملزما في** انحائه كافة	Adj	'shall be binding' — Art.13	(modal + be+Participle)	Unit shift	Textual eq.
16	تكافؤ الفرص حق مكفول لجميع العراقيين	Participle	Equal opportunities are guaranteed for all Iraqis— Art.16	(modal + verb)(passive)	Unit shift+ structure shift	Textual eq.
35	**تكفل** الدولة حماية الامومة	V	'The state **shall guarantee** protection of motherhood' — Art.35	(modal + verb)	Unit shift	Textual eq.

Discussion

This analysis in table (2) reveals that different lexical forms have been used to express modality in Arabic . More specifically , Obligation has been expressed by the use of Arabic forms (e.g., يجب ان , على) and rendered into their English equivalents modal verbs such as "shall", "must" . The translator performs unit shift to reach textual equivalence that produces the same legal effect in the target text.

Table (3): Analysis of Expressing Prohibition in the Iraqi Constitution and its English Renditions

Article	SL Item	SL Realization	TL item	TL Realization	shift	Type of translation
2/أ	ا- **لا يجوز** سن قانون يتعارض مع ثوابت احكام الاسلام	V negative	'No law **may be enacted**...' — Art.2	(modal +Be+ Ved)	Unit shift+ structure shift	Textual eq.
9/2	**يحظر** تكوين ميليشيات عسكرية خارج اطار القوات المسلحة	V	'It **is prohibited** to form militias' — Art.9(2)	(be+Ved)	Structure shift	Textual eq.
18/4	**يحظر** اسقاط الجنسية العراقية عن العراقي	V	'**No** Iraqi **may have** nationality withdrawn' — Art.18(4)	(modal + V)	Unit shift	Textual eq.
23/2	لا يجوز نزع الملكية الا لاغراض المنفعة العامة	V negative	Property **may not be taken** away except for the public interest in exchange for fair compensation.	(modal +be+ V+ed)	Unit shift+ structure shift	Textual eq.
المادة 37	**يحرم** العمل القسري السخرة	V (active)	Forced labor, slavery and the commerce in slaves **is forbidden**	(be+Ved)	Structure shift	Textual eq.
39	**لا يجوز** اجبار احدٍ	V negative	'No one **may**	(modal +	Unit shift+	Textual eq.

	على الانضمام الى اي حزبٍ او جمعية او جهة سياسية		**be compelled** to join a party' — Art.39	be+ Ved)	structure shift	
46	**لا يكون** تقيد ممارسة اي من الحقوق والحريات الواردة في هذا الدستور او تحديدها الا بقانون	V negative	'Rights **shall not be restricted** except by law' — Art.46	(modal + be+Ved)	Unit shift+ structure shift	Textual eq.

Discussion

Table (3) shows that in rendering prohibition, negative constructions such as   لا يجوز, يحظر were generally rendered adequately as *shall not* or *may not*, though inconsistencies appeared when negation was distant from the modal auxiliary. In some cases, ***is not allowed*** or ***is prohibited*** replaced ***shall not***, reflecting stylistic rather than functional equivalence. Unit shifts and structure shifts indicated in the table are used to reach textual equivalence that insure the same legal effect of the source text in the target text.

Table (4): Analysis of Expressing Necessity in the Iraqi Constitution and its English Renditions

Article	SL Item	SL Realization	TL item	TL Realization	shift	Type of translation
(13/أولاً) :	ويُعدُّ هذا الدستور القانونَ الأعلى والأسمى في العراق، **ويكون ملزماً** في أنحائه كافة وبدون استثناء.	active participle	"This Constitution is the preeminent and supreme law in Iraq and **shall be binding** in all parts of Iraq without exception."	**shall be +V+ing**	Class shift+ structure shift	Textual eq.
(49/أولاً) :	**يتكون** مجلس النواب من عددٍ من الأعضاء بنسبة مقعد واحد لكل مائة ألف نسمة من	V	"The Council of Representatives **shall be composed of** a number of	**shall be +V+ed**	Structure shift	Textual eq.

	نفوس العراق.		members at a ratio of one seat per one hundred thousand people."			
(112/أولاً)	تقوم الحكومة الاتحادية *بإدارة* النفط والغاز المستخرج من الحقول الحالية...	V	"The federal government **shall manage** the oil and gas extracted from current fields…"	Modal +V	Class shift	Textual eq.
18 رابعا	*وعلى* من يتولى منصبا سياديا او امنيا رفيعا، *التخلي* عن اية جنسية اخرى مكتسبة	Preposition	Those who take a leading or high-level security position **must give up** any other citizenship. This shall be regulated by law.	Modal +V	class/structure shift	Textual eq.

Discussion

In case no. (1) in table (4) shows a class shift from: اسم فاعل participle functioning as adjective to Participle used adjectivally in English. This shift is obligatory to realize textual equivalence in English . Whereas the second case no.(2) is a case of structure shift when the Arabic simple active verb (يتكون = "consists of") is rendered in English as a passive modal construction ("shall be composed"), . In case no.(3), the Arabic construction (verb "يكون" + prepositional phrase "بإدارة" = "to be under the management of"), while the English version uses a verbal construction ("shall manage"). This shift is also obligatory to realize textual equivalence in English . In case no (4) , the translator achieves textual equivalence in the target text in rendering necessity implicitly indicated in " وعلى من" into " must give up ," . The translator performs a an obligatory shift (structure-based necessity to modal-based necessity) and specifically a class/structure shift (from nominal to verbal construction).This shift makes the necessity more explicit and binding in English legal style to keep the same legal effect.

Conclusion

The paper concludes that despite the fact that AI can be used as a tool to analyse translated texts to find out the lexical items used to express modality in legal Arabic and their equivalent ones in the

translated versions, still there is a need for human post editing of the analyses. In terms of translation, the translator showed different types of shifts in rendering modality in the English translation of the Iraqi Constitution .It also reveals a complex interaction between unit shifts and structure shift used by the translator to reach textual equivalence. The analysis shows that the translator has used textual equivalence in 18 sample out of 20 in order to keep the same legal effect of the text and to avoid loss of meaning. Formal correspondence, on the other hand, has been used only in two cases out of twenty. The study, thus, reveals certain verbal forms and expressions used to express modality in Arabic legal texts with their translational English equivalents .   In some cases , AI falsely identified some cases as devices of expressing modality as in referring to   nouns like حرية , احرار in the expressions ... لكل مواطن الحرية في as indicators of permission; the correction is that permission is expressed in the use of the preposition لام.

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