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# The Quality of Legal Translation via Neural Machine Software DeepSeek Case Study

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**Abstract:**

This research aims to assess the quality of legal translation by evaluating outputs from neural machine translation (NMT) applications, specifically the DeepSeek program. In fact, NMT has sparked a genuine revolution across multiple domains. Conversely, legal language is a highly technical language characterized by a distinct and precise terminological framework. This necessitates the translator's mastery of legal texts and his provisions prior to undertaking translation. Consequently, the study shed light on the following questions: What quality standards are envisaged for legal text translation using NMT programs? Have these systems succeeded in fulfilling the communicative purpose by aligning their computational frameworks with human cognition? And what are the necessary measures that should be adopted to enhance the quality of neural machine translation?

**Keywords:** Specialized Translation; Juridical Translation; Neural Machine Translation; Quality of Translation.

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# La Qualité de la Traduction Juridique via les logiciels automatiques neuronaux Cas de : DeepSeek

**Résumé :**

Cette recherche vise à étudier la qualité de la traduction juridique en évaluant le produit final (outputs) de traduction automatique neuronale (TAN). La TAN a provoqué une véritable révolution dans de multiples domaines. À l'inverse, le langage juridique est une langue éminemment technique caractérisée par un cadre terminologique distinct et précis. Cela nécessite de la part du traducteur une maîtrise préalable des textes et des dispositions juridiques avant d'entreprendre la traduction. Par conséquent, la présente étude aborde les questions suivantes : Quels standards de qualité sont envisagés pour la traduction de textes juridiques à l'aide de programmes de TAN ? Ces systèmes ont-ils réussi à remplir la finalité communicative en alignant leurs architectures computationnelles sur la cognition humaine ? Et quelles mesures nécessaires devraient être adoptées pour améliorer la qualité de la traduction automatique neuronale ?

**Mots-clés:** Traduction spécialisée; Traduction juridique; Traduction automatique neuronale; Qualité de la traduction.

# جودة الترجمة القانونية من خلال البرامج الآلية العصبية

## برنامج ديب سيك أنموذجا

**أ. بن بالي طيب**

جامعة حسيبة بن بوعلي الشلف

**الملخّص:**

تهدف هذه الدراسة إلى استقصاء جودة الترجمة القانونية عبر تقييم مُخرجات الترجمة الآلية العصبية، من خلال تطبيقها على برنامج ديب سيك ( DeepSeek) أنموذجاً، فبينما تعرف الترجمة الآلية العصبية نقلة نوعية حقيقية في شتى الميادين، تقف اللغة القانونية في الجهة المقابلة بوصفها لغةً تقنيةً شديدة الخصوصية، قائمةً على نسق مصطلحي فريد ومحدد، مما يفرض على المترجم ضرورة التمكن من النصوص والتشريعات القانونية قبل الاضطلاع بمهمة الترجمة. وعليه، نسعى من خلال هذه الدراسة إلى الإجابة عن التساؤلات التالية: ما هي معايير الجودة المعتمدة لتقييم ترجمة النصوص القانونية باستخدام برامج الترجمة الآلية العصبية؟ وما مدى نجاح

هذه الأنظمة في بلوغ الغاية التواصلية من خلال محاكاة أطرها الخوارزمية للعقل البشري؟ ما هي الإجراءات الواجب اتخاذها لرفع مستوى جودتها؟

**الكلمات المفتاحيّة:** الترجمة المتخصصة؛ الترجمة القانونية؛ الترجمة الآلية العصبية؛ جودة الترجمة.

**1. Introduction:** The integration of Neural Machine Translation (NMT) into professional practice represents a technological revolution, offering fluid, context-aware translations that surpass earlier automated systems. Its potential application in legal translation promises significant gains in efficiency. However, this convergence creates a critical and underexplored tension. Legal language is a hyper-specialized system, characterized by precise terminology, rigid formalism, and deep embeddedness within specific jurisdictional and cultural contexts. It does not demand only linguistic transfer, but a jurilinguistic transfer that requires an understanding of the legal concepts and systems, underlying both source and target texts.

This study addresses this core tension by investigating a pivotal question: Can current NMT systems, which operate on statistical pattern recognition and reasoning, meet the exacting quality standards required for authoritative legal translation? The research moves beyond generic evaluation to perform a diagnostic analysis of NMT performance in this high-stakes domain. It originally lies in its domain-specific focus on legal language, its application of a tripartite theoretical framework to categorize errors (juridical, linguistic, terminological), and its empirical case study of a cutting-edge, reasoning-based NMT model.

The central problem is a fundamental mismatch. While NMT excels at syntactic fluency and general contextualization, it lacks the jurisprudential reasoning to navigate the systemic and conceptual uniqueness of law. Consequently, we hypothesize that NMT will demonstrate significant shortcomings in achieving *functional juridical equivalence*, often selecting generic or cross-jurisdictionally inappropriate terms. We further posit that errors will frequently be *pragmatic* - producing syntactically correct but legally misleading output - and that translation quality will remain critically dependent on expert, context-rich user instruction.

To test these hypotheses, the study employs a qualitative comparative methodology. A corpus of authentic French legal texts is translated into Arabic using a leading NMT system, namely DeepSeek. These outputs, which form the experimental group, are rigorously compared to professional human translations. Discrepancies are systematically analyzed and categorized using the aforementioned framework to identify the precise nature, location, and frequency of NMT failures against benchmarks of clarity, precision, appropriateness, and systemic fidelity.

**2. Neural Machine Translation:** Neural Machine Translation (NMT) simulates human cognition by leveraging artificial intelligence resources to contextualize content. (Popel, Martin et al. 2020). It employs deep neural network models to learn and optimize interlingual translation processes. This technology excels in contextual handling compared to prior approaches, significantly enhancing overall translation quality. These models utilize an architecture known as the *neural framework* to represent texts and learn patterns and relationships between words and sentences across languages. (Bahdanau, D., Cho, K., & Bengio, Y. 2015).

From an operational perspective, Machine Translation (MT) – intrinsically linked to translational action in both concept and production – denotes standardized techniques using computational software (computerized systems) to transfer content from a primary natural language termed the "Source Language (SL)" to a secondary natural language termed the "Target Language (TL)". The source text processed by the MT system is designated the "Input Text", which undergoes computational processing to generate a translated "Output Text". (بلقاسمي، 2021، ص 49).

Core scientific disciplines underpinning sixth-generation computing technology, including Physiology, Psychology, Linguistics and Logic. (see: علي، نبيل. (2000) ص 124)

Artificial Intelligence (AI) constitutes a foundational element of cognitive science, increasingly relying on practical applications spanning four core mental domains: perception, reasoning, language, and action. Consequently, it frequently emulates human cognitive functions.

Neural Machine Translation emerged as the culmination of sustained research in computational linguistics and MT, delivering breathtaking results compared to Rule-based systems relying purely

on contrastive linguistics and Statistical Machine Translation (SMT) systems using analytical translation approaches.

**3. Specialized Translation:** Specialized translation is defined as the translation of written texts in Languages for Special Purposes (LSPs). LSPs are language varieties found in documents with a predominant emphasis on conveying information to a restricted target community, ranging from experts to laypersons. These languages are characterized by distinctive terminological features and a specialized use of textual, syntactical, and lexical features drawn from general language. (Scarpa, 2020, p. 3).

Although Gile does not provide a single, concise definition of "specialized translation" as such, he characterizes it indirectly through the properties of the text it handles. In his work La traduction: la comprendre, l'apprendre, he highlights the importance of terminological accuracy in this type of text:[...] its terminology, in the case of a specialized text, must be accurate. Any language error gives the reader a bad impression, but a terminological error in a specialized text can have much more serious consequences." (Gile, 2005, P 37)

Frequently, specialized translators must function as de facto terminologists and lexicographers rather than mere consumers of existing terminology. Their frontline position requires them to identify appropriate equivalents for novel or infrequent terms - often before formal terminologists can address them -compelling translators to autonomously research optimal solutions under time constraints.

Consequently, Neural Machine Translation (NMT) faces the challenge of linguistic specialization inherent to modern translation. NMT systems must now comprehensively cover diverse domains accessible to users. This study therefore examines the quality of legal text translations generated by NMT through comparative analysis with human translations.

**4. Legal Translation:** Legal translation constitutes a specialized branch dealing with legislative texts, regulatory provisions, and judicial instruments. The conceptual and terminological framework of legal language is systemically unique, demanding translators comprehend terms within their native legal semantic sphere. Legal translation weaves together two languages representing

distinct legal systems, wherein terms are predefined by statutory and regulatory provisions of each jurisdiction and remain untranslatable outside their original legal context.

Legal language itself renders legal translation exceptionally complex. As an entity inextricably bound to its native legal system, it constitutes "a technical language that defies definition" (Šarčević, 1997. P 5).

Therefore, Legal translation is complex; it requires special skills, knowledge and experience on the part of the translator. The complexity and difficulty of legal translation is attributable to the nature of law and the language that law uses (Cao, 2007, P 15-25).

**4.1 Legal Translation Strategies:** Through this section, we attempt to present various strategies that may assist the translator in achieving a legal translation that fulfills the communicative purpose intended in the source text:

**4.1.1 Functional Equivalence:** Functional equivalence in translation science means "the homogeneous relationship between the communicative values of the source text and the target text, as well as between words, sentences, idiomatic expressions, and syntactic structures." (Nord, 1997, 138). In legal translation, functional equivalence means that the translator translates a legal term in one legal language with what functionally equates to it from a legal term in another legal language. (Cao, 2007, P 15-25) If a language is used to express more than one legal system, such as Arabic in which several legal systems intersect (Sharīʿa, Napoleonic law, French law, customary law, etc.), as well as the English language in which there is one legal system (British and American, *inter alia*), then functional equivalence means translating the legal term from the legal system of the source language to what parallels and functionally equates to it in the legal system of the target language.

One may resort to the functional equivalence strategy especially in countries that rely on two different languages and one legal and legislative system, for example Canada, which uses French and English, as well as Belgium which uses French and Dutch, and Switzerland which uses French and German.

**4.1.2 Formal Equivalence:** Formal equivalence focuses on the message itself, in both form and content. In such a translation one is concerned with such correspondences as poetry to poetry, sentence to sentence, and concept to concept. Viewed from this formal orientation, one is concerned that the message in the receptor language should match as closely as possible the different elements in the source language" (Nida, 1964p. 159)

The translator resorts to formal equivalence in the absence of functional equivalence due to the difference between the legal systems of the source language and the target language. It means the equivalence of the two texts at the verbal and lexical level. The translator thus translates the term in the source language with its lexical equivalent in the target language, meaning translating it literally whenever possible. Literal translation in this context is the safest way to express the meaning of the original term, but it is not feasible in all cases.

**4.1.3 Explicative Translation:** "The explicative translation involves adding explanations or clarifications in the target text, either in the form of footnotes, comments, boxes, or directly within the text in parentheses, to clarify specialized terms, cultural references or ambiguous expressions in the source text" (Baker, 1992, pp. 38-40).

The strategy of explicative translation is particularly used for texts with a high cultural or technical load, where the target reader could not fully understand the text without additional explanation (Munday, 2012, p. 47).

The translator resorts to explanation in the text when necessary to achieve optimal communication intended from the legal text under translation. This is because some terms and vocabulary with overwhelming cultural charge or strong cultural connection to a specific culture or legal system saturated with an alien culture cannot be understood by themselves. Appropriate explanation or description is indispensable for comprehension and thus for achieving the desired communication. The technique of in-text explanation is very important and is considered a middle solution because it shortens the long distance between different cultures.

Among the manifestations that embody the cultural gap between the two languages, we mention for example the Algerian Family Law derived from the provisions of benevolent Islamic Sharīʿa and

its French translated version. On numerous occasions, explicative translation was resorted to in order to overcome terminological and conceptual obstacles between the two languages or rather between the two legal systems. For instance, the term **"العدة"** (ʿIddah), which was translated into French as *"La retraite légale"* (the legal waiting period), will not convey its intended meaning in the Arabic text unless a comprehensive and sufficient explanation is provided in a footnote or marginal note.

**4.1.4 Omission:** Omission means not translating linguistic textual elements in the source text that contain no additional information for the translation recipient and whose omission causes no impairment in meaning or deficiency in information whatsoever. (Baker, 1992, P 40) Dickens notes that this technique is frequently resorted to when translating from Arabic into English, particularly when translating elements with a specific cultural character that have no equivalent in English culture. (Dickins et al., 2002, p. 25).

Omission in legal translation must be approached with extreme caution, as deleting any element from a legal document can arouse suspicion among lawyers and judicial authorities. However, omission is permissible when it targets culturally or religiously charged phrases that carry no substantive legal information. The translator may omit such elements without impairing the legal validity of the text. This strategy can be exemplified when a contract beginning by the religious opening phrase "الحمد لله وحده" ("Praise be to God alone") commonly found in Arabic notarial contracts, which can be omitted when translating into French or English. Moreover, the Hijri date appearing alongside the Gregorian date in Algerian legislation, where the Islamic calendar date may be dropped since the Gregorian date alone suffices for establishing the law's enactment date, avoiding unnecessary foreignness in the target text.

**4.1.5 Domestication or Adaptation:** Venuti defines domestication as the dominant and inherently ethnocentric translation strategy in Anglo-American culture, which seeks to eliminate the foreignness of the source text by making it fully conform to the linguistic patterns, stylistic conventions, and cultural values of the target language. The goal is to produce a translation that reads with fluency and transparency

- using current usage, continuous syntax, and precise meaning - so that it appears "not in fact a translation, but the 'original'". (Venuti, 1995, p. 15).

This illusion of originality erases the translator's intervention, rendering them invisible, while simultaneously masking the violent ethnocentric reduction of the foreign text, a process Venuti describes as "bringing the author back home". (Venuti, 1995, p. 20).

Ultimately, domestication is not a neutral technique but a cultural-political practice that reinforces the hegemony of English-language values; it is, in Venuti's critical view, "symptomatic of a complacency in Anglo-American relations with cultural others, a complacency that can be described [...] as imperialistic abroad and xenophobic at home" (Venuti, 1995, p. 20-30).

Through this strategy, the translator seeks to domesticate the translation not only according to the legal system of the target language but also according to prevailing linguistic and terminological standards. For instance, the term *Code* in French or *lawbook* in English, which is expressed in the Algerian legal system by the term **"قانون"** (qānūn), in the Tunisian legal system by **"مجلة"** (majalla), in the Egyptian legal system by **"قانون"** (qānūn), and in Syria and Lebanon by **"أصول"** (uṣūl) and **"قانون"** (qānūn) as well. Here falls upon the translator the necessity to adapt the equivalent according to the legal usage of each state.

The adaptation technique is also used when translating numbers. Most Arab states in the Orient use Eastern Arabic or Indian numerals (٠, ١, ٢, ٣), while Tunisia, Algeria, and Morocco use Western Arabic or European numerals (0,1,2,3). Here the translator must adapt the translation according to the target text readers to achieve greater fluency and transparency in translation.

**4.1.6 Foreignization and/or Borrowing:** One usually resorts to the borrowing technique in the absence of a natural equivalent for the word in the target language. It is among the simplest techniques addressed by the Canadian theorists Vinay and Darbelnet in their research on comparative stylistics. It means transliteration, i.e., the process of literally transferring words and sounds using the writing system of the target language. (Vinay & Darbelnet, 1995, p. 31-32).

Transliteration or borrowing is considered one of the foreignization procedures in translation, which Venuti views as among the most important characteristics of translation because it reveals the linguistic and cultural dimension of the source language and preserves the distinctiveness of the translation from the source text. For him, it is a form of accepting the Other and resisting the ethnocentricity advocated by the localization strategy in translation. (Venuti. 1995. p 20)

Transliteration, when resorted to, is not self-evident because its purpose is to appreciate the foreign term that has no functional equivalent, no lexical-verbal equivalent, cannot be explained in the text, and cannot be omitted during translation, and to understand and assimilate its concepts to achieve the communicative purpose. Appreciation is only possible when the source and target languages are languages related by kinship at the phonological, morphological, grammatical, and lexical levels. If an English translator leaves the French term *Code civil* as is in an English text, this will not greatly affect communication because the English reader, especially the legal one, will appreciate the French term and place it in its linguistic, legal, and cultural context. Whereas if an English translator transliterates the term **"ثيّب"** (*thayyib*) into Latin script without explanation, no reader of the text who is unfamiliar with Islamic Sharīʿa and its provisions will appreciate the meaning of thayyib.

**4.1.7 Terminological Neologism:** Terminological neologism is the final technique that can be resorted to after exhausting all the strategies explained above. A new term may be generated in the target language provided that the selected word has no terminological or semantic function in the legal system to which the translator is translating into its legal language. If the selected word has any functionality, however minimal, in the legal system to which the translator is translating into its legal language, then its use leads only to communicative confusion and disorder. In this context, any words in the general language unrelated to the legal system of the target legal language may be considered suitable words to be endowed with the meanings of the terms to be translated. (Van Hell, J. G., & De Groot, A. M. B. 1998. P 23).

Generating a new term carries grave risks for the linguistic system of any language. The translator must ensure the neologized term has no other connotation and must, if possible, consult specialized legal and judicial experts and coordinate with a specialized terminologist to lend greater legitimacy to the neologized term.

When coining a new legal term, the translator must follow a strict protocol: first, exhaust all alternative translation strategies; second, verify that the proposed term has no current or historical legal function in the target language's legal system; third, consider the perspectives of legal professionals and the translation's purpose to ensure the term fulfills its communicative function; and finally, where appropriate, draw upon the terminological resources of other legal systems within the target language, such as the multiple legal traditions present in Arabic. (السليمان، 2011، ص 153)

**5. Quality of Legal Translation:** The concept of quality in translation is a standardized concept addressed by numerous translation scholars and theorists, given its special importance as it concerns the final product of translation. According to House: " Translation quality assessment can thus be said to be at the heart of any theory of translation." (House, 1997, p01) The differing perspectives on translation quality stem from different translation schools, and thus the process of evaluating translation quality is an inverse reading of the translation process itself.

Legal translation, as a form of specialized translation, is fundamentally pragmatic, prioritizing terminological precision and systemic fidelity over aesthetic considerations. According to Cao (2007), its quality is determined by several criteria, specifically: (Cao, 2007, p 35-39)

- **Clarity**: unambiguous terminology.
- **Appropriateness**: conceptual alignment within the legal framework.
- **Conciseness**: adherence to the technical and economical nature of legal language.
- **Precision**: accurate and objective terminological equivalence.
- **Mastery of dual legal systems**: deep understanding of both source and target legal contexts, whether civil, common, or Islamic law.
- **Preservation of formal style**: maintaining the distinctive register of legal discourse.
- **Compatibility with cultural-legal context**: ensuring meanings are conveyed appropriately within the intersecting legal cultures.

**6. Translation via Neural Machine Translation Program:**

We will attempt below to analyze and evaluate the translation of selected legal sentences and terms through neural translation program. We have chosen one of the most widely used programs currently: **DeepSeek translation.**

**DeepSeek translation:** A neural machine translation (NMT) system powered by DeepSeek-R1, a 671B-parameter open-weight large language model (LLM) developed by Chinese AI firm DeepSeek. Launched in 2025, it leverages mixture-of-experts (MoE) architecture and reinforcement learning for reasoning tasks, enabling high-precision, context-aware translations across 100+ languages at 10× lower cost than competitors. (https://www.techtarget.com/)

**6.1. DeepSeek Translation System: A Technical Synthesis**:

The DeepSeek translation system represents an advanced evolution in neural machine translation, distinguished by its use of reasoning-enhanced large language models **(LLMs)** rather than conventional encoder-decoder architectures. Its performance is built on three core technical innovations.

Architecturally, the system rests on three pillars: Rule-Guided Reinforcement Learning (RGRL) allows the model to develop internal reasoning pathways for resolving ambiguities (polysemy, syntax, cultural nuance) without step-by-step human feedback; a sparse Mixture of Experts (MoE) architecture activates only relevant subnetworks for each task, achieving high knowledge capacity with low computational cost; and DeepSeek Sparse Attention (DSA) enables processing of up to 128,000 tokens, ensuring terminological and stylistic consistency across entire documents.

Operationally, DeepSeek functions as an instruction-following agent within a conversational interface. It accepts text or uploaded documents, and its output quality is critically dependent on prompt specificity**.** Detailed instructions framing the task (e.g., "act as a professional legal translator") yield markedly superior results. The system then performs contextual reasoning and generation, ensuring cross-sentence coherence.

Critically**,** DeepSeek excels in technical and document-level translation where precision is paramount, offering a cost-effective solution for large-volume tasks. Its limitations include stylistic rigidity for creative content and a fundamental dependence on human-in-the-loop prompting. Overall, it represents a paradigm shift from statistical alignment to instructed, contextual reasoning, positioning it as a powerful tool for specialized translation that still requires expert human guidance.

**7. Analysis of DeepSeek legal translation:**

A critical analysis of the machine translation of certain legal terms and expressions from French into Arabic, conducted using the DeepSeek model, revealed several layers of ambiguity. The principal issues identified are as follows:

**7.1 Juridical ambiguity:** In the translation of a judicial ruling concerning a divorce between spouses issued by a French court, the term **"Juge aux affaires familiales"** appeared. According to French legislation, this refers to a magistrate specializing in family law within the Judicial Court (known until 2020 as the Tribunal de Grande instance), who is responsible for resolving disputes in matters such as divorce, parental authority, child support, protection of victims of domestic violence,

and safeguards for minors. (Civil Procedure Law: Article 1070 and Judicial Organization law: Article L213-3)

Considering the target audience of the translation—legal professionals in Algeria, including lawyers, judges, and public prosecutors—the objective is to produce an official translation that aligns with the target legal system. Therefore, a functionalist approach to translation must be employed to identify a functional equivalent suitable within the Algerian legal context. As emphasized by Sarcevic (1997), "A legal translation should be faithful to the function or purpose of the law being translated" (Sarcevic, 1997, p. 12). Similarly, Vermeer (1978) notes that "the intentionality of a translational action stated in a translation brief, the directives, and the rules guide a translator to attain the expected target text" (Vermeer, 1978, pp. 12–15).

When the original ruling was processed using DeepSeek's translation based on Neural Machine Translation, the term **"Juge aux affaires familiales"** was rendered as قاضي الأحوال الشخصية. At a formal level, this translation appears appropriate, as it refers to a judge specializing in all matters related to family and personal status, including marriage, divorce, alimony, custody, lineage, guardianship, and inheritance. Such matters are typically adjudicated based on Islamic law and relevant legal frameworks in Arab countries (Shwra.sa, Retrieved on September 22, 2025, from https://www.shwra.sa/ar/blogs/محاكم-الأحوال-الشخصية).

It should be noted, however, that although the term قاضي الأحوال الشخصية is widely used in the legislation of various Arab and Islamic countries, such as Saudi Arabia and the United Arab Emirates, the Algerian legal system initially adopted this term, then replaced it later by قاضي شؤون الأسرة. Under amendments introduced by Law No. 08-09, relating to the Civil and Administrative Procedure Code, published in the Official Journal No. 12 on February 25th, 2008, the terminology was updated to reflect an expansion of the judge's jurisdiction. The updated term now encompasses all family-related disputes, moving beyond traditional matters such as marriage, divorce, and inheritance. Thus, the term قاضي شؤون الأسرة is the functional equivalent and more accurately reflected in contemporary Algerian law as a specialized and comprehensive judicial authority covering all types of family litigation.

Consequently, while DeepSeek's translation demonstrates an effort to identify a functional equivalent, it ultimately relies on terminology prevalent in Gulf legal systems without sufficient adaptation to the target legal context- in this case, Algerian law. This oversight persists despite the clarification made by the user that the translation was intended for use in a judicial setting in Algeria.

**7.2 Linguistic Ambiguity:** In DeepSeek's translation of the same judicial ruling, linguistic ambiguity emerges in the translation of the following sentence: "Il produit au soutien de sa demande deux attestations," which was rendered into Arabic as: "يقدم دعماً لطلبه شهادتين."

From a linguistic perspective, we observe that the French formulation is frequently used, particularly in French legal contexts, where the verb "produire" here signifies the submission of documents or specific files supporting the concerned party's petition. In contrast, we note linguistic inelegance in the target text produced by the DeepSeek application, as the reader of the translation encounters ambiguity in understanding the intended meaning of the translated phrase. The phrase "يقدم دعماً" suggests material or moral support, whereas the source text aims to indicate the reinforcement of the case file with documents or files.

Within the same context, the ambiguity becomes particularly evident in the continuation of the translated phrase: "لطلبه شهادتين." This translated phrase lacks correct syntactic structure. Moreover, this translation distorts the meaning, and it would have been more appropriate to translate it as: "يُدعّم العارض طلبه بشهادتين..."

**7.3 Terminological Ambiguity:** DeepSeek's translation of the same judicial ruling also exhibits terminological ambiguity in rendering the following expression:

"La chambre des Notaires" was translated as "غرفة كاتبي العدل".

Referring back to the meaning of the expression in the source text, we find it commonly used in French legislation to denote:

"Une chambre des notaires est une association professionnelle défendant les intérêts des notaires dans un département donné. Elles sont dirigées par des membres de la profession. Ce système de chambre départementale a été créé en 1803, ce qui fait du notariat la première profession à être

organisée sur le modèle des institutions ordinales." (Décret n°45-0117 du 19 décembre 1945 pris pour l'application du statut du notariat)

It appears that the term "كاتبي العدل" is frequently used in Middle East Arab countries such as Saudi Arabia and Kuwait, whereas in Algeria, the term "الموثق" is employed. However, there are subtle differences between them: a "كاتب العدل" is a government employee who notarizes official transactions in a government office, while a "الموثق" is an authorized public officer practicing the profession of notarization in a private office. The key distinction lies in their official capacity; the notarization by a "كاتب العدل" carries official legal force by virtue of being a state employee, whereas the notarization power of a "الموثق" might be limited in some cases.

It is noteworthy that the source text expression here refers to the "Chamber of Notaries" ( غرفة الموثقين), not "كاتبي العدل." Consequently, DeepSeek's translation missed the mark and failed to select the most appropriate equivalent for the legal expression due to terminological ambiguity in the source phrase, compounded by the variation in terminology across Arab countries, which poses challenges for neural machine translation in conveying technical legal terms.

The following table presents some of the discrepancies we identified through the Neural Machine Translation of the DeepSeek program regarding a judicial ruling issued by a French court:

| Source text | Target text | Observation |
|---|---|---|
| Tribunal de Grande instance | محكمة الجنحة الكبرى | المحكمة الابتدائية الكبرى / الأولى |
| Chambre du conseil | غرفة المشورة | غرفة الاستشارة |
| Juge des affaires familiales | قاضي الأحوال الشخصية | قاضي شؤون الأسرة |
| Il produit au soutien de sa demande deux attestations | يقدم دعماً لطلبه شهادتين | يُدعّم طلبه بشهادتين |
| Liquidation et partage des intérêts patrimoniaux des époux | تصفية وتقسيم المصالح المالية للزوجين | تصفية وتقسيم الأملاك الزوجية بينهما |
| La chambre des notaires | غرفة كاتبي العدل | غرفة الموثقين |

| | | |
|---|---|---|
| Le juge aux affaires familiales, statuant publiquement, par jugement réputé contradictoire en premier ressort, après débats en Chambre de conseil. | قاضية الأحوال الشخصية، تصدر حكمها علناً، بحكم يعتبر غيابياً في درجة أولى، بعد المداولات في غرفة المشورة | حكمت قاضية شؤون الأسرة، علنيا واعتبارا حضوريا، وابتدائيا، بعد المداولات في غرفة الاستشارة |
| la copie est conforme à la minute de l'acte | النسخة مطابقة لدقيقة العقد | نسخة مطابقة للعقد الأصلي / نسخة طبق الأصل |

Based on the translation errors presented in the table, a critical analysis reveals systemic weaknesses in Neural Machine Translation (NMT) when applied to specialized legal discourse. The most profound failure is the lack of mastery over dual legal systems. NMT consistently treats legal terms as mere linguistic units rather than concepts embedded within specific jurisdictional frameworks. This is vividly illustrated by its inability to distinguish between functionally similar but systemically distinct terms. For instance, it renders the French professional body "La chambre des notaires" using the Gulf Arab term for a government-appointed scribe (كاتبي العدل), instead of the appropriate term for a privately practicing notary in the Algerian context (الموثق). Similarly, it selects a generic, pan-Arab judicial title (قاضي الأحوال الشخصية) over the precise, modern Algerian equivalent (قاضي شؤون الأسرة). These errors demonstrate a fundamental incapacity to achieve true juridical appropriateness or cultural-legal compatibility, as the system cannot map concepts correctly between the source and target legal universes.

Compounding this systemic failure are critical lapses in terminological precision and clarity. The NMT output frequently substitutes vague or literal translations for exact legal terminology, leading to significant conceptual blurring. A clear example is the translation of "intérêts patrimoniaux des époux" – referring to the couple's matrimonial property assets – as the ambiguous " المصالح المالية للزوجين" (the financial interests of the spouses). The most egregious error of this kind is the purely literal and nonsensical translation of "la minute de l'acte" (the notarial master copy) as "دقيقة العقد" (the minute of the contract). Such mistakes render the output unreliable, as they obscure or entirely distort the intended legal meaning, violating the core principles of precision and unambiguous clarity required in legal texts.

Furthermore, the translations exhibit syntactic and pragmatic infelicities that undermine formal style. The NMT engine often generates grammatically awkward constructions that lack the concise, authoritative tone of legal language. The phrase "يقدم دعماً لطلبه شهادتين" for "Il produit... deux attestations" is both syntactically poor and pragmatically misleading, incorrectly framing the formal submission of documents as "offering support." This breakdown in formal register is particularly evident in longer, formulaic sentences. The translation of the full judicial clause loses the precise, ritualized phrasing of a ruling, resulting in text that is not only inaccurate in key terms (e.g., misrepresenting "réputé contradictoire" [deemed adversarial] as "غيابياً" [by default]) but also stylistically deficient. Ultimately, this pattern of errors confirms that current NMT operates on a linguistic, statistical level without the necessary conceptual understanding for legal translation, positioning it firmly as a drafting aid that requires essential human expertise for validation and post-editing.

The pattern of errors confirms a fundamental hypothesis: Current NMT operates primarily on a linguistic and statistical level, lacking the deep conceptual and systemic understanding which is required for reliable legal translation. It cannot perform the essential jurilinguistic transfer that involves mapping a term from one legal universe to its true functional equivalent in another legal universe.

- It is not a translator of law; it is a translator of words that happen to be in a legal text.
- Consequently, its output cannot be considered final or authoritative for any professional or official legal purpose.
- Its utility is limited to that of a powerful first-drafting tool, which must then undergo rigorous post-editing by a human expert with mastery of both the source and target legal systems.

These findings strongly advocate for a human-in-the-loop model where NMT assists with initial phrasing, but the human legal translator ensures juridical accuracy, terminological precision, and systemic appropriateness.

**8. Conclusion:** This study critically evaluates the intersection of advanced neural machine translation (NMT) with the specialized field of legal translation. Through a detailed analysis of outputs from the DeepSeek model, it identifies a persistent gap between the system's technical sophistication and the stringent demands of legal discourse. The research demonstrates that, while NMT excels at syntactic transfer and general contextualization, it consistently falls short in three critical areas: achieving precise juridical equivalence, navigating terminological ambiguity across different legal systems, and preserving the cultural-legal specificity inherent in legal texts. These shortcomings underscore the enduring necessity of domain-specific human expertise. The study thus contributes to the theoretical discourse by reaffirming that legal translation is not merely a linguistic act, yet it is a complex jurilinguistic transfer that requires deep systemic knowledge; a capacity that current NMT architectures have not yet fully replicated.

The investigation yields clear, evidence-based answers to the guiding research questions. First, the quality standards for legal NMT must be exceptionally high, encompassing not only the established criteria of clarity, conciseness, and precision but, more critically, functional appropriateness within a specific legal jurisdiction and systemic fidelity to the source and target legal frameworks. Second, the findings indicate that current NMT systems, including DeepSeek, have not fully succeeded in aligning their computational processes with the nuanced cognitive and jurisprudential reasoning required for authentic legal communication. The observed errors in juridical and terminological equivalence reveal a disjunction between algorithmic pattern recognition and the conceptual understanding mandated by legal translation. Consequently, third, the primary measure for enhancing NMT quality in this domain is the development of robust human-in-the-loop frameworks. This involves integrating NMT as a powerful drafting tool within a workflow that mandates rigorous post-editing by legal translation specialists, the development of curated, jurisdiction-specific terminology databases, and the implementation of prompt engineering techniques that explicitly instruct the AI on the required legal function and context.

The study carries dual implications: for legal translators, it advocates supervised NMT use while rejecting it as a standalone solution for authoritative documents; for developers, it urges hybrid systems trained on annotated legal corpora to handle cross-jurisdictional concepts. Future research should prioritize longitudinal error tracking, standardized benchmarking for legal AI, and explainable AI techniques to render NMT reasoning auditable. Ultimately, the paper concludes that the path forward lies not in human-machine opposition, but in synergistic collaboration where AI augments legal expertise.

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