



Bilingual Legal Resources for Arabic: State of Affairs and Future Perspectives

Sonia A. Halimi¹

Accepted: 20 September 2023 / Published online: 21 October 2023
© The Author(s) 2023

Abstract

The context-based use of terminology and phraseology is one of the essential building blocks of legal translation. The contextual nature of both components has implications when it comes to designing resources that are adapted to the needs of translators. For Arabic legal translation, there are a multitude of different print and online resources available, however, they do not integrate the context-related parameter for term choice acceptability. In this article, we will describe the main features of certain bilingual legal dictionaries with the English-Arabic and French-Arabic language pairs. We will then make a descriptive assessment of the tools available online, highlighting their limitations. Taking into consideration all the contextual parameters involved in making a translation choice, we will put forward the value of developing bilingual ontologies with Arabic. With the rapid expansion of information technologies, a move towards formalizing legal knowledge will help fill existing gaps in the representation of Arabic legal content and the retrieval of information, providing legal translators with a tool that provides specific details that will enable translators to make informed and relevant decisions, in addition to opening new research perspectives for Arabic legal translation.

Keywords Legal dictionaries · Arabic resources · Ontologies · Legal translation · Arabic translation

1 Context

The international legal context is characterized by a process of legal globalization, giving rise to a need for legal translation in numerous situations, including the implementation of international standards in the field of human rights (ex. communica-

✉ Sonia A. Halimi
Sonia.Halimi@unige.ch

¹ Faculty of translation and interpreting, University of Geneva, Geneva, Switzerland

tions to the Human Rights Council, actions to the International Criminal Court, etc.), mutual legal assistance between States (letters by rogatory commissions, etc.), international corporate collaboration (contracts, assurance services, etc.), international immigration (official documents like family registers, diplomas, etc.), etc. In that sense, legal translation contributes not only to giving laypeople access to a legal text written in a language that is not their own, but also maintaining international cooperation, international public policy and diplomatic relations [22, 30].

Legal translation from and into Arabic is relevant to all the aforementioned situations, as Arabic is one of the working languages in international multilingual institutions, and, more specifically, the United Nations (UN) and its specialized agencies. It is also a vivid illustration of the expansion of diverse language use around the world, particularly on the internet, where Arabic has become among the most widely used languages in recent years [44]. However, the evident linguistic differences between Arabic, as a Semitic language, and other Indo-European languages—English or French, for instance—on lexical and syntactic levels unequivocally pose additional problems when rendering texts into Arabic. When it comes to the legal field, in addition to challenges that arise due to language barriers, there are also legal specificities and inter-cultural differences related to national systems that must be taken into consideration. Working with legal material entails dealing with information on legal realities and traditions that involve different conceptual and procedural referents. Understanding legal systems and their functioning is therefore beneficial for any kind of information handling, *a fortiori* translation. More specifically, in multilingual international settings, much of the legal material includes national sources of law, which leads to issues of interpenetration between legal systems, variability of concepts and a need to contextualize the terminology that is generated, all of which has an impact on translation choices.

Comparative legal translation studies [14, 33, 41, 47, 52] have widely explored the challenges posed by texts that transcend national laws, and led to legal translation methods, models and frames. With regard to term conceptualization, the evolution of legal lexicography is reflected in works where the emphasis is given to a back-and-forth movement between law and terminology, informed by real-life legal cases [8, 37, 43]. The making of legal resources is thus supplemented by conceptualization and legal knowledge transfer bringing new insights into the legal dictionary.

In Arabic legal studies, while corpus and comparative-based studies had been the subject of recent, high-profile studies (for a summary, see [26]), the discipline of legal-dictionary making has traditionally been related to the theory and practice of lexicography in general (see Sect. 3). Legal terminology is addressed through a traditional approach of concept description and term listing. Different types of legal lexicographic tools are available in print and online. They may be lists of specialized terms in the form of glossaries, terms with linguistic knowledge that constitute lexical databases, terms with definitions for monolingual, bilingual or multilingual dictionaries, hierarchically represented vocabulary in thesauri, and bitexts in parallel corpora for contextual searches. However, they do not adopt a lexicographical approach to the semantics of legal concepts.

Against this background, examining features of the main legal dictionaries for translation seems appropriate to set the state of art of Arabic legal resources. As not

all resources can be covered in this study, an emphasis is put on the English – Arabic and French – Arabic language pairs. Three research questions guided this descriptive study:

- 1) How have bilingual dictionaries in some European languages developed in recent decades?
- 2) What are the main features of English-Arabic and French-Arabic legal dictionaries?
- 3) How to reach concept matching in bilingual legal resources?

As there is no inventory of the available online and print legal resources for Arabic translation, we will first provide an overview of existing tools, the problems they present, and potential solutions. In Sect. 2, we give a brief account of the state of certain legal bilingual dictionaries in European languages and the developments that have been made. In Sect. 3, we examine print legal bilingual dictionaries that include Arabic, highlighting their features and limitations. An assessment of online resources for Arabic legal translation is provided in Sect. 4, opening up new prospects for using ontology to address legal translation problems. Concluding remarks are presented in Sect. 5.

2 Bilingual Dictionaries in European Languages and Recent Resources

Precursor studies initially gave rise to an interest in bilingual legal dictionaries [17, 45, 46, 48]. Through the analysis and comparison of bilingual legal dictionaries, different conceptions of the law in various legal cultures emerged. The specificities of the laws, in terms of legal vocabulary, classifications and categories, justify the use of a comparative approach. The meaning of a legal concept therefore goes beyond what an ordinary bilingual dictionary can tell us.

In one of the first studies conducted by de Groot and van Laer [17], two decades ago, to evaluate bilingual legal dictionaries used in the EU community, the quality of the resources reviewed was considered ‘poor’ due to the limited encyclopaedic information they contain and the absence of systematic references to the legal systems of the terms being handled. Previously, while conducting research that led to the elaboration of a bilingual legal dictionary, Thiry [49] had already taken note of the literalness of words in bilingual terminology. This not only revealed a certain carelessness when it comes to choosing terminology and creating lexicon, but above all reflected a lack of system-related knowledge that is closely tied to the kind of knowledge that is necessary to express legal information in a specific language. Since then, the effort to improve the design of specialized dictionaries has favored systematized models with more encyclopaedic knowledge to facilitate the search for relevant information and treat the notion not as an isolated unit, but as a representation that fits into its own notional system.

A renewal of lexicographical and terminological production in European languages has led, in recent decades, to remarkable progress in the designing of lin-

guistic and lexicographical resources, and the innovative development of bilingual dictionaries in the legal field. Some dictionaries are particularly noteworthy for their conceptual organization of a particular field and the extensive amount of concepts analyzed. They are useful to translators, thanks to the definitions and characteristics they provide through comparisons of concepts in different legal systems. This contextualization promoted by comparative law has given rise to a newfound awareness of the necessity of looking beyond the definition of an isolated legal term. This kind of approach is well-illustrated by the bilingual French-Spanish dictionary on Extra-Contractual Civil Liability in Spanish and Belgian law [47]. The dictionary is organized based on the elaboration of notional schemes in that specific field, giving primacy to the notional in the original content of each of the legal systems being compared.

Other legal dictionaries have focused on how terminology is handled by branch of law in two comparative legal systems. They thus provide detailed information on the subject matter and complement general legal dictionaries. The Manuel of *Terminologie juridique et administrative internationale*, German-French [27], for example, provides definitions of the most important terms in Labour Law and Social Security Law in the source language and in-depth explanations of the conceptual differences between the two legal systems – German and French – thus allowing the concepts to be understood in their original context.

We may also cite Kaufmann's Dictionary of Labour Law and Social Security Law, German-French and French-German, *Dictionnaire de droit du travail et de droit de la sécurité sociale, allemand-français et français-allemand* [29], which presents the two national fields of law of public officials in Germany (*droit des Agents de la puissance publique*) and staff of public services and public companies in France (*Personnel des services publics et des entreprises publiques*) through vocabulary that is classified by subject and includes definitions, explanations, and specific phrases. The systematic description and comparison of concepts facilitates the understanding of system-related differences.

Continuing along the lines of the comparatist approach, Peñaranda [39] describes the terminology of criminal procedure (English-Spanish and French-Spanish), highlighting translational problems related to asymmetry between criminal proceedings. Monjean-Decaudin [34] proposed contextualized term records that led to the development of a juritraductology base that continues to be maintained, but can only be accessed by the members of the Centre for Interdisciplinary Research in Juritraductology. Each term entry (*fiche juritraductologique*) is rich with terminological elements and describes in detail the semasiological and onomasiological phases of the juritraductological process, before putting forward a translation proposal. In parallel, the results of the LAW10n project (Localisation of technology law: software licensing agreements) [43] show the usefulness of a contextualized lexicographic approach, which combines corpora analysis and comparative law methodology by specifying, for each entry, the type of translation (instrumental or documentary), depending on the translation scenario. Conversely, it also reveals the limitations of terminological databases that rely only on the conceptual system of the source language. Bajčić [8] addressed the methodological evolution of legal lexicography by exploring the semantics of legal concepts and the legal dictionary. The perception of term meaning

as a dynamic process which involves conceptual knowledge in the give-and-take of law and terminology is highlighted and integrated in the making of a legal dictionary as part of the cognitive terminological approach.

Recent research in multilingual legal terminology management has been oriented towards using institutional big data. In legal terminology management, the LETRINT project (Legal Translation in International Institutional Settings: Scope, Strategies and Quality Markers) (2015–2022), for example, draws upon three institutional corpora from the UN, European Union (EU), and the World Trade Organization (WTO) to develop translation quality markers in international institutional settings, focusing on context-based specificities of terminology [42]. Using document mapping technology, the LYNX project (2017–2021) relies on EU legal big data and artificial intelligence to provide effective ways of accessing immense quantities of digital regulatory documents (national legislations, case laws, industry norms, etc.) based on a Legal Knowledge Graph [32]. Legal ad hoc terminologies presented by corpus and in readable-machine format are linked and structured in semantic web form.

These developments are realized in the Indo-European languages with regard to legal dictionaries and concept search tools. Where do matters stand for Arabic legal resources? In order to answer the question, it seems right as corollary to start by outlining features of bilingual legal dictionaries in, specifically, English-Arabic and French-Arabic language pairs.

3 Bilingual Legal Dictionaries for Arabic: Features and Limitations

Studies conducted by Arabic-speaking linguists and lexicographers over the past decades [3, 4, 10, 21] paint a very critical picture of the state of lexicographical production in Arabic in general and of bilingual and multilingual specialized dictionaries in particular. According to the literature, the designing of specialized dictionaries lacks theoretical foundations and guidance on their use. Specialized dictionaries continue to be produced without asking fundamental questions about the lexicographic process: for whom is the dictionary intended; what is the basis for the choice of data; and how are headwords lexicographically addressed? Furthermore, the break with Arabic lexicographical heritage and the lack of interest in ancient lexicographical references, particularly in the natural sciences (agriculture, medicine, and chemistry), as attested by Galfan [21] and Ben Mourad [11], do not favour the use of specialized terminology that has been established for centuries, hence resulting in a multitude of unstable and dubious Arabic concordances for a single specialized term.

As for the bilingual legal dictionaries, we conducted a brief review of the tools that are available for a bilingual search in both the French-Arabic and English-Arabic language pairs in the legal field. We started with some of the most well-known bilingual legal dictionaries, as presented below. None of the dictionaries have been recently revised or consolidated in a new edition, and most of them are still only available in print, with the exception of Al Wahab's *Law Dictionary* [5] and Faruqi's *Law Dictionary* [19]. These resources have four main features that can be summarized as follows.

3.1 Dictionaries Representing Lists of Terms

These dictionaries are presented in the form of glossaries or nomenclatures in which the definition, an essential component in the constitution of a dictionary, is absent. As de Groot and van Laer [17] note in relation to European languages, a list of legal terms is given in the source language, and one or more words are provided in the target language, without any information on the legal context or system. Examples include Hakki's *Dictionnaire des termes juridiques et commerciaux* [24], Moussa's *Lexique des termes juridiques, français-arabe* [35] and Belefkih's *Lexique pluridisciplinaire* [9].

3.2 Dictionaries with General Subject Matter

Under the entry of a legal headword, non-legally marked variants are displayed in these dictionaries. Words from everyday language are used, for example, the expression [Taqem Shaay] “يأش مقاط” (tea service) under the entry “service”, in Chellalah's *Dictionnaire pratique de droit-commerce-finance* [16]. The dictionary includes general words as headword entries as well, such as porter [Bawaab] (بأوب), paradise [Janna, Firdaws, Na'im] (جن، سدرف، ميعن)، and ridge [Haska] (تلكسح).

This practise can also be observed in much newer legal dictionaries, such as Abi Fadel's *Dictionnaire des termes juridiques* (2004), where headword entries include kind, gentleman, kindness, flower, detergent, etc. Similarly, under the entry ‘passage’ [2], one is presented with different uses of the word (*passage à niveau, passage clouté, passage d'un texte, barrer le passage, la vie est un passage, plaisir de passage*, etc.). Oddly, however, the expression ‘passage à l'acte’ (to commit or act out (an offence)), which has clear legal connotations, is absent.

3.3 Dictionaries with Various term Proposals Without Context

In these dictionaries, a selection of words is given under a headword entry without specifying their semantic divergence, subject matter or legal system. In Najjar, Badaoui and Chellalah's *Nouveau dictionnaire juridique* [36], for example, under the entry “information” (collection of evidence), one can choose from three different proposals [Istidlaal, Isti'laam, I'laam] (مأل عتسا، مال دتسا)، but each word actually refers to a specific stage in judicial procedure. The same observation can be made with regard to Abi Fadel's dictionary (2004), where various correspondents that are not legally interchangeable are presented under the entry “information” [I'laam, Nabaa, Istidlaal, al Bahth 'an al Dalil] (لأل دلأ ن ع ث ح بلأ، مال دتسا، ربخ، أب ن، مال ع). Conversely, the term that is used in most Arab jurisdictions to refer to the information stage in criminal proceedings, [al Tahqiq] (قأ قأ ح تلأ)، is missing from the entry.

3.4 Dictionaries Representing Translations of Existing Dictionaries

It is likely that the use of translated dictionaries is restricted to the underlying conceptual organization of the original text. However, what is not clear is whether Arabic-translated terminology is linked to any specific Arabic legal system. As a matter of

fact, in the French-to-Arabic translation of Hachette-Antoine's *Lexique des termes juridiques* [15] and Cornu's *Vocabulaire juridique* [6], the proposed Arabic terms seem to simply be a translation of the French legal system terminology. Such an approach goes against the commonly accepted belief that laws represent cultures and languages, and not universal referents.

As previously mentioned, the only two resources available online in a scanned version are the long-established English-Arabic Ibrahim Al Wahab's *Law Dictionary* (1963) [5] and Faruqi's *Law Dictionary* (1969/2008) [19]. Despite their recognized authority, they have not been consolidated or revised recently. In addition to organizing terms according to branches of law, Al Wahab's *Law Dictionary* [5] presents important phrases in Arabic that are useful for drafting. Latin and ancient legal terms are also included. Although a word may have multiple meanings, no definition or encyclopaedic information is provided. As for Faruqi's *Law Dictionary* [19], under each entry, an extensive definition is provided in Arabic with information on the term, relevant branch of law and legal system (English, Scottish, or American), along with useful phraseology. However, the dictionary covers a wide variety of fields, including forensic medicine, commerce, banking, insurance, civil aviation, diplomacy, and petroleum, making it less exhaustive in terms of law. Other print dictionaries consulted in the context of this study share the same features listed above. To get a comprehensive picture of all types of bilingual legal resources, an examination of accessible online tools seems unavoidable.

4 Review of Online Resources for Arabic Legal Translation

With the expansion of Arabic language use on the internet, we can observe the proliferation of all sorts of bilingual legal resources destined for translators. Many of them are the result of individual initiatives in the form of glossaries whose validity cannot be confirmed. Institutional databases, which are mainly compiled by international organizations, are gradually providing open access to their term bases and official translated documents. Concomitantly, the development of large parallel corpora related to computer-assisted translation tools and Machine Translation (MT) systems, such as Glosbe or Reverso, are replacing traditional terminological databases, as they provide solutions with peripheral phraseology. With Glosbe, the user can even look at the metadata. Other online tools, such as KudoZ and the Proz.com discussion forum, are not sufficiently well-developed in Arabic to serve as an effective source for terminology searches.

Dictionaries and glossaries. A simple search of online legal Arabic dictionaries leads to either book libraries or platforms directing users to institutional terminological bases (ex. UNTERM) or compilations of terms that are labeled as dictionaries. Browsing through the pages of platforms (ex. Lexicool directory) reveals that most legal bilingual and multilingual resources with Arabic are limited to glossaries without definitions or legal system-based information. Evidently, the relevance of such individual contributions cannot be verified and their authority can be put into question. For copyright reasons, Arabic dictionaries in the legal domain are not available on the web, as is the case for dictionaries in general. The scarcity of legal e-diction-

aries extends to all languages in general, since legal dictionaries “tend to be owned by legal publishers, thus, not accessible and sometimes published in obsolete and proprietary formats.” [38: 170].

Terminological databases. Institutionally constructed resources, such as UNTERM, ILOTERM, FMI, WIPO, and OIT¹ are increasingly available online. They are being improved to include relevant information on a term’s use, thereby helping to solve translation problems. However, their terminology is bound by occurrences in in-house documents, limiting term coverage to the accepted practices of international institutions. Search results do not refer to other concepts used under national legislations. The UN term base (UNTERM), which is considered to be a resource with high quality control, still has undesirable features due to in-house-centred information that is barely able to support the expanding use of contextual bases. A quick search in the UNTERM or official document system (ODS)² reveals two main features. Firstly, that it is highly UN-system oriented, thereby restricting its applicability for translation situations (see example below), since it does not provide all the information required to meet translation needs for all legal situations of communication. Secondly, that it is less aware of national-system variations, thus creating uncertainties with regard to term applicability (see example below), as existing variants are not covered.

Parallel corpora. Because it contains full-text digital UN documents from the Security Council and General Assembly for administrative purposes, the online official document system (ODS) is a source of extensive, revised parallel corpora. This institutional e-resource is very useful for international legal document translation in particular. However, using the platform as a legal translation source proves to be time-consuming, as it does not offer the possibility of displaying the different language versions of a document in parallel, which would allow for a quick search. Other e-resources that are equally as helpful for legal translators are contextual search platforms that support the Arabic language, such as Glosbe and Reverso

³Although they are not exclusively law-oriented per se, they provide several translation proposals using free dictionaries and translation memories with in-context translations. Being able to carry out a contextual search is clearly of interest for translators, thanks to the number of translated sentences and phrases that are proposed, which highlight the term within its phraseological environment and provide the reference of the source document. However, many translated occurrences are deemed to be irrelevant and their authority can be put into question.

Although parallel corpora provide a handy search feature, the issue of term choice acceptability is yet to be resolved, as search results do not necessarily produce relevant counterparts related to the legal system or branch of law. Contextual search engines still lack accuracy and relevancy when it comes to context-related use and translation advice. For translation into Arabic, many term queries in English or French that are submitted to contextual searches result in terminological variability. This variation may derive not only from non-overlapping conceptual systems or

¹ There are large institutional corpora that do not include Arabic, such as *IATE* and *WTOTERM*.

² Search in UNTERM and ODS (consulted 12-05-2023).

³ The platform *Linguee* does not include the Arabic language.

cases of isomorphism, but also differences in lexical uses in terms (ex. legal bodies, titles, judicial structures) within the same language [25]. Indeed, one of the major challenges encountered by legal translators arises from international institutional documents that refer to both the rules and provisions of national legislation and international instruments, principles and standards that do not depend on a single normative space, or documents that put two different systems in contact.

The concept of ‘assignment of receivables’, *cession de créance*, [Hawalat al Haq] (حلالا ؤل او ح) or [Ihalat al Mustahaqaat] (تاق ح تس م ل ا ؤل ا ح), neatly illustrates this point. It is a complex concept that needs to be carefully handled when translating into Arabic, as the concept is subject to different interpretations by the four schools of thought in Islamic jurisprudence. In regulating the provisions of transfers (Hawala) (ؤل او ح) in Arabic-speaking countries, the ‘Assignment of the Right’ (Hawala al Haq) (ؤل او ح) (حلالا ؤل او ح) refers to the transfer of debt in the field of assignment of rights in most civil laws, thus eliminating many rights by considering them to be non-assignable rights in accordance with the ruling principles and provisions of Islamic jurisprudence [31].

A search for the term ‘assignment of receivables’ or *cession de créance* in Arabic in UN documents and the term base directs users to the internationally established term [Ihalat al Mustahaqaat] (تاق ح تس م ل ا ؤل ا ح), principally referring to the *United Nations Convention on the Assignment of Receivables in International Trade* [50]. Similarly, matching segments in the open platforms Glosbe and Reverso⁴ propose the internationally used term [Ihalat al Mustahaqaat], unaware of the relevant term used in national laws, which is [Hawalat al Haq] (حلالا ؤل او ح). This detracts from the proper use of terminology, as information is limited to what is provided by the UN term database or the contextual search platforms, [Ihalat al Mustahaqaat] (تاق ح تس م ل ا ؤل ا ح) even though the internationally accepted term is not well-adapted for all translation situations. Drawing attention to the use of different terminology in national or regional institutions is therefore critical to solving issues of legal terminology.

Important concepts in the laws of international trade and secured transactions are designated differently in the terminology of the United Nations Commission on International Trade Law (UNCITRAL), where the choice of vocabulary is influenced by a desire to infuse international discourse with metalanguage that strives for a universality of concepts [51]. Metalanguage criteria can therefore be defined by two cumulative elements: the coordination of language choices and the acceptance of common concepts as a consequence of the latter coordination [51]. This tendency towards uniformization of international trade concepts gives rise to confusion in Arabic terminology use if relevant encyclopaedic information is absent.

The aim in international commerce drafting is to develop an autonomous terminology to avoid term confusion between internationally agreed concepts and national system-based concepts. However, by referring to only internationally accepted terms, relevant terms that are best known to translators end up being excluded. Legal knowledge that is crucial for an appropriate translation is therefore overlooked. In order for a translation to fulfill its purpose, access to contextual information should not be avoided for the sake of institutional term uniformity.

⁴ Search on Reverso and Glosbe (consulted 12-05-2023).

Against this background, UN agencies have carried out extensive work to capture institutional data for machine translation and terminology search in working languages, including Arabic. Firstly, an institutional MT tool based on statistics and trained data, the Translation Assistant for Patent Titles and Abstracts (TAPTA) [40], was successfully developed. It is dependent on the Bilingual Evaluation Understudy (BLEU) system for post-editing. The system has been expanded to cover 10 pairs of languages in a cloud-based SMT service. Thanks to its integration with the UN's in-house computer-assisted translation tool eLUNA, the tool is now considered a critical global element in the UN translation toolkit [53]. Both systems' data are trained on large and extensive in-house parallel corpora. Their results are therefore limited to in-house data, and, by extension, the UN context. However, if they were open-access sources, they would still be of great use in legal translation, thanks to the authority of the UN language services as a source of expert information. These MT systems, combined with in-house CAT tools, are institutional and not open to public use. Aside from UN staff, the eLuna interface currently cannot benefit other users. That being said, this technology solution still presents disadvantages with regard to the relevance of translation choices, as it only provides parallel segments of texts as translation proposals. There is still a proportion of irrelevant results that show non-contextualized translation choices: no indication is given on national or regional uses, nor is any translation advice provided. Technology-based solutions need then higher level of semantic knowledge and conceptualization for a better understanding of legal documents. Expert knowledge bases such as bilingual ontologies can facilitate legal concept understanding and terminology management in the source and target languages.

5 Ontology as a Bilingual Legal Resource

Major technological breakthroughs in artificial intelligence, knowledge representation, and computer-assisted technologies have helped develop expert knowledge bases. The last decade has seen rapid growth in the interest of researchers in developing specialized ontologies that offer conceptual information with categories of concepts and terms, as building ontologies is now considered a crucial part of the semantic web endeavor [7]. In the field of law, ontologies have been widely used by practitioners and scholars, as well as laypeople in varied situations, for example, when simulating legal actions, semantic search and indexing, and maintaining laws and regulations up-to-date [18].

In translation, not much attention has been given to developing bilingual legal ontologies for translation problem solving. A decade ago, this same analysis was put forward in a study by Orozco and Gijón [37], who affirmed that “whilst legal ontologies would appear to have tremendous potential in the future, those available at present offer limited information of the kind that is of use” (37: 29). Since then, the use of ontologies has been preceded by an interest in parallel corpora *as training data for statistical machine translation*. Building ontologies in the legal field is not geared toward translation tasks. While initial European projects related to laws have led to various projects mapping out the laws of European Union member states, such as JurWordNet [23], LRI-Core [13], DALOS project [20], and LYNX project [32],

they are not destined for translators and hence do not provide sufficient comparative information. They are meant to harmonize European laws and compare legislation in different languages to detect incompatibilities, differences, or similarities between legislations [23].

5.1 Arabic Ontologies

There has been little research on ontologies in Arabic. Thus far, developing ontologies from Arabic text is considered a difficult process due to the lack of machine-readable resources and the complexity of the grammatical, morphological, and semantic aspects of the Arabic language [7]. Nevertheless, some Arabic ontologies have been recently developed in specific fields, such as infectious disease [7], word synonymy [28], national criminal law [12], and news [1]. In the legal field, building an ontology would require taking into consideration the specificities of the Arabic language in combination with variations in legal traditions in Arabic-speaking countries. Formalizing Arabic legal knowledge would consist of formally representing similarities and differences at the concept and term levels of Arabic legal systems. Similarly, building a bilingual ontology implies establishing correspondences and identifying similarities and differences at the concept and term levels in the two languages. Incompatibilities are thus highlighted and can then be addressed by proposing contextualized counterparts. Recent research on Arabic ontologies, which we have not been able to access, does not cover bilingual legal ontologies involving Arabic and a second language.

A domain-specific legal ontology for translation purposes implies that the knowledge base will provide a comparison of concept categories and descriptions of concept features, thereby enabling the translator to make choices that are relevant to a specific communicative situation by semantically disambiguating terms through specific insights that are contextually grounded and can be applied to particular settings. This approach is not only important when the target text has to achieve legal status in the target law and acquire a legal effect identical to that of the source text, but also when the translated text does not belong to the same legal system as the original text. The translated text gains clarity and consistency by describing legal concepts with system-specific referents. As for the international institutional context, in addition to formalising legal knowledge, building ontologies with Arabic enables the detection of Arabic term variations that are not the result of legal system decisions, but ineffective term choice.

6 Concluding Remarks

The shortcomings noted in print bilingual dictionaries with Arabic provide momentum towards a more comprehensive approach to knowledge representation, including technology-based and contextually sensitive resources. As might be reasonably expected, legal resources compiled within the framework of well-resourced languages could benefit substantially by developing knowledge or lexicographical tools in less-represented languages.

There is a real terminological heterogeneity in Arabic legal dictionaries, glossaries, terminological bases and institutional websites, which evidently compromises the reliability of the information that is presented.

With the expansion of online content, benchmark resources with a high degree of accuracy and completeness are needed to ensure that information undergoes quality control for interoperability. A shift towards formalizing Arabic legal knowledge will fill existing gaps when it comes to representing legal content and retrieving information, thereby providing legal translators with a tool that contains details allowing translators to make informed and relevant choices, in addition to opening new research perspectives for Arabic legal translation. Bilingual ontologies that include Arabic for translation purposes would provide a comparative view of legal systems in two languages so that relevant terminological choices can be identified and a shared understanding of knowledge can be established in a particular legal domain of interest. In addition, well-constructed ontologies would help resolve issues of heterogeneity, discrepancy and confusion when applying various system-based Arabic terminologies.

Funding Open access funding provided by University of Geneva.

Open access funding provided by University of Geneva

Declarations

Statements and Declarations The author has no relevant financial or non-financial interests to disclose.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

1. Abdullah, Abdulhussein M., Miaad, and Raisan. 2015. Building a core arabic ontology for iraqi news. *International Journal of Engineering and Advanced Technology* 4(6): 171–177.
2. Abi Fadel, Philippe. 2004. *Dictionnaire des termes juridiques, français-arabe*. Beyrouth: Librairie du Liban.
3. Al Boucheikhi, Ezzedine. 2003. Nahwa TaSaour Jadid Li Bina Al Mu'jam Al 'ilmi Al 'arabi Al MukhtaS: Mu'jam Al MuStalahat Al Lisaniya Namuthajan. [Vers une nouvelle conception de la lexicographie spécialisée arabe] *Majalat Majma' Al Lugha Al Arabiya bi Dimashq / Revue de l'Académie Arabe*, 78(4).
4. Al Qassimi, Ali. 1991. 'ilm Al Lugha wa Sina'at Al Mu'jam. [La linguistique et la lexicographie] *MaTbu'aat Jami'at Al Riyadh / Les Presses universitaires de Riyadh*
5. Al Wahab, Ibrahim. 1963. *Law Dictionary, English-Arabic*. Baghdad: The National Printing and Publishing Co. W.L.L.

6. Al-Qadhi, Mansur. 1998. *Dictionnaire du Vocabulaire juridique, français-arabe. Traduction en arabe du Vocabulaire juridique, (dir.) Gérard Cornu* (1996). Beyrouth/Paris: Majd, Centre universitaire pour la recherche, l'édition et la distribution/Presses Universitaires de France.
7. Alsudias, Lama, and Paul Rayson. 2020. Developing an Arabic infectious disease ontology to include non-standard terminology. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*, 4842–4850, Marseille, France. European Language Resources Association.
8. Bajčić, Martina. 2017. *New insights into the semantics of legal concepts and the legal dictionary*. Amsterdam: Benjamins.
9. Al-Miftah, Belefkih, Abdelfettah. 1998. *Lexique pluridisciplinaire, français-arabe/arabe-français*. Madrid: Printex.
10. Ben Mourad, Ibrahim. 1997. *Muqadima Li Nadhariyat Al Mu'jam*. Beyrouth: Dar Al Gharb Al Islami [Introduction aux théories lexicographiques].
11. Ben Mourad, Ibrahim. 2008. *Massail Fi Al Mu'jam*. Beyrouth: Dar Al Gharb Al Islami [Questions de lexiques].
12. Bouaziz Mezghanni, Imen, and Faiez Gargouri. 2017. CrimAr: a criminal arabic ontology for a Benchmark based evaluation. *Procedia Computer Science* 112: 653–662.
13. Breuker, Joost, and Rinke Hoekstra. 2004. Epistemology and ontology in core ontologies: FOLaw and LRI-Core, two core ontologies for law. In *Proceedings of the EKAW*04 Workshop on Core Ontologies in Ontology Engineering*, 1–14, Northamptonshire (UK), CEUR-WS. <http://ceur-ws.org/Vol-118/paper2.pdf>.
14. Cao, Deborah. 2007. *Translating law*. Clevedon: Multilingual Matters.
15. Chamel, Bassil, Claire Bechara, and Romy Rahmé. 2010. *Lexique des termes juridiques, français-arabe-anglais. Traduction en arabe du Lexique des termes juridiques* (2009). Paris/Liban: Dalloz;Hachette-Antoine.
16. Chellalah, Youssef. 1973. *Dictionnaire pratique de droit-commerce-finance, français-arabe*. Beyrouth: Dar Nahdhat Lubnan.
17. De Groot, Gerard-René, and J. P. Van Laer, Conrad. 2008. The Quality of Legal Dictionaries: an Assessment. In *Maastricht Faculty of Law Working Paper*. (full text on <http://arno.unimaas.nl/show.cgi?fid=13383> [Consulted 15 May 2023]).
18. Rodrigues, De Oliveira, Cleyton Mário, Gonçalves de Freitas, and Frederico Luiz. Spósito Barreiros, Emanuel Francisco, Ribeiro de Azevedo, Ryan, and Trigueiro de Almeida Filho, Adauto. 2019. Legal ontologies over time: a systematic mapping study. *Expert Systems with Applications* 130, 12–30.
19. Faruqi, Harith Suleiman. 1969/2008. *Faruqi's Law Dictionary, English-Arabic*. Beyrouth: Librairie du Liban Publishers.
20. Francesconi, Enrico, and Daniela Tiscornia. 2008. Building Semantic Resources for Legislative Drafting: the DALOS Project. In *Computable models of the Law. Lecture notes in Computer Science*, 4884 ed. Berlin, Heidelberg: Springer. https://doi.org/10.1007/978-3-540-85569-9_4. (consulted 15.05.2023).
21. Galfan, Mustafa. 1998. Al Mu'jam Al Muwahad Li MuSTalahaat Al Lisaniyaat: Ayyi MusSTalah Li Ayyi Lisaniyaat? [Dictionnaire unifié des termes linguistiques; quel terme pour quelle linguistique?] *Majalat Al Lisaan Al Arabi / Revue de la langue arabe*, 46.
22. Gallas, Tito. 2006. Understanding EC Law as 'Diplomatic Law' and its Language. In *Multilingualism and the Harmonisation of European Law*, edited by Barbara Pozzo and Valentina Jacometti, 119–128. The Hague: Kluwer.
23. Gangemi, Aldo, Alessandra Prisco, Maria-Teresa. Sagri, Steve Geri, and Daniela Tiscornia. 2003. Some Ontological Tools to Support Legal Regulatory Compliance, with a case study. In *On the move to Meaningful Internet Systems 2003: OTM 2003 Workshops. Lecture notes in Computer Science*, vol. 2889 Berlin, Heidelberg: Springer. https://doi.org/10.1007/978-3-540-39962-9_64. (consulted 15.05.2023).
24. Hakki, Mamdouh. 1982. *Dictionnaire des termes juridiques et commerciaux, français-arabe*. Beyrouth: Librairie du Liban.
25. Halimi, Sonia. 2017. Contextualising translation decisions in legal system-bound and international multilingual contexts. French-arabic criminal justice terminology. *Translation and Translanguaging in Multilingual Contexts* 3(1): 20–46.
26. Halimi, Sonia, and Al Wazna. 2023. Rafat. Issues addressed in Arabic legal translation: A future perspective, in Anne Wagner and Aleksandra Matulewska (Ed). *Research Handbook on Jurilinguistics*. Edward Elgar Publishing Ltd.

27. Institut international de terminologie juridique et administrative. 1985. *Manuel de terminologie juridique et administrative internationale, allemand-français*. Berlin, Bonn and Munich: Carl Heymanns Verlag.
28. Jarrar, Mustafa. 2021. The Arabic Ontology -An Arabic Wordnet with ontologically clean content. *Applied Ontology* 16(1): 1–25. <https://doi.org/10.3233/AO-200241>. (consulted 10 June 2023).
29. Kaufmann, Otto. 2004. *Dictionnaire de droit du travail et de droit de la sécurité sociale, français-allemand, allemand-français*. München: C.H. Beck.
30. Kraus, Peter A. 2018. Between minority protection and linguistic sovereignty. *Revista de Llengua i Dret* 69: 6–17.
31. Mahasneh, Nesrin S. 2015. Islami wa Al Fiqh Al Gharbi. *International Review of Law* 8: 1–16. <https://doi.org/10.5339/irl.2015.8>. (consulted 20.06.2023). Al Tandhim Al Qanuni Lil Hawala Fi Al Qanun Al Madani Al Qatari: Taqyim Fikrat Al Mazj Bayna Ahkam Al Fiqh Al.
32. Maslias, Rodolfo. 2021. Lynx legal terminology platform. *Legal Terminology Workshop*. Luxembourg: Terminology Coordination-European Parliament <https://termcoord.eu/legal-terminology-workshop/> (consulted 24.06.2023).
33. Mattila, Heikki S. 2013. Comparative legal linguistics: Language of law, Latin and modern lingua francas (2e éd.). Farnham: Ashgate.
34. Monjean-Decaudin, Sylvie. 2012. Fiche juritraductologique complétée. CERIJE. <https://www.cerije.eu/banque-juritraductologique/> (consulted 24.06.2023).
35. Moussa, Fadhel. 1993. *Lexique des termes juridiques, français-arabe*. Tunis: Orbis impression.
36. Najjar, Ibrahim, Zaki Badaoui, Ahmed, and Youssef Chellalah. 2006. *Nouveau dictionnaire juridique, français-arabe*. Beyrouth: Librairie du Liban.
37. Orozco, Mariana, and Pilar Sánchez-Gijón. 2010. New Resources for Legal Translators. *Perspectives: Studies in Translatology* 19(1): 25–44.
38. Patricia, Martín-Chozas, Elena Montiel-Ponsoda, and Rodríguez-Doncel Víctor. 2019. *Ginevra Peruginelli, Sebastiano Faro (Eds.) Frontiers in Artificial Intelligence and Applications*. 170–180. Amsterdam: The authors and IOS Press. Language Resources as Linked Data for the Legal Domain.
39. Peñaranda López, A. 2015. *Proceso penal comparado (España, Francia, Inglaterra, Estados Unidos, Rusia)*. Grenade: Comares.
40. Pouliquen, Bruno, Christophe Mazenc, and Aldo Iorio. 2011. Tapta: A user-driven translation system for patent documents based on domain-aware Statistical Machine Translation. In *Proceedings of the 15th Annual Conference of the European Association for Machine Translation*, 5–12, Leuven, Belgium. European Association for Machine Translation (EAMT).
41. Prieto Ramos, Fernando. 2014. Parameters for problem-solving in legal translation: implications for legal Lexicography and Institutional Terminology Management. In *The ashgate handbook of legal translation*, United Kingdom: Ashgate Publishing.
42. Prieto Ramos, Fernando and Giorgina Cerutti. 2021. Terminology as a source of difficulty in translating international legal discourses: an empirical cross-genre study. *International Journal of Legal Discourse* 6(1): 155–179.
43. Prieto Ramos, Fernando, and Orozco Jutorán, Mariana. 2015. De la ficha terminológica a la ficha traductológica: hacia una lexicografíaal servicio de la traducción jurídica. *Babel* 61(1): 110–130.
44. Rashid, Ahmad, Do-Omri, Alan Haidar, Mohamed A. Liu, Qun, and Mehdi Rezagholizadeh. 2020. *From Unsupervised Machine Translation to Adversarial Text Generation*. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 8194–8198.
45. Reynolds, Thomas. 1986. Comparative legal dictionaries. *American Journal of Comparative Law* 34(3): 551–558.
46. Šarčević, Susan. 1989. Conceptual dictionaries for translation in the field of Law. *International Journal of Lexicography* 2(4): 277–293.
47. Šarčević, Susan. 1997. *New approaches to legal translation*. The Hague, London, Boston: Kluwer Law International.
48. Thiry, Bernard. 2000. Equivalence bilingue en traduction et en terminologie juridiques: Qu'est-ce que traduire le droit ? In *Conference Proceedings: La traduction juridique, histoire, théorie(s) et pratique*, 1–16.
49. Thiry, Bernard. 2005. *Diccionario jurídico: terminología de la Responsabilidad civil, español-francés, francés-español*. Granada: Comares. Colección Interlingua1.
50. United Nations. 2004. *United Nations Convention on the assignment of Receivables in International Trade*. New York: United Nations Publication.

51. Vieillard, Guillaume. 2014. La contribution de la Commission des Nations unies pour le droit commercial international (CNUDCI) à l'harmonisation et l'uniformisation du droit commercial international. *Centre de recherche sur le droit des marchés et des investissements internationaux* Université de Bourgogne. UFR Droit et Science politique.
52. Wagner, Anne, and Le Cheng. 2020. Law as a culturally constituted sign-system: a space for interpretation. *International Journal of Legal Discourse* 5(2): 239–267.
53. Ziemski, Michał, Junczys-Dowmunt, Marcin, and Bruno Pouliquen. 2016. The United Nations Parallel Corpus v1.0. In *Proceedings of the Tenth International Conference on Language Resources and Evaluation*, 3530–3534, Portorož, Slovenia. European Language Resources Association (ELRA).

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Terms and Conditions

Springer Nature journal content, brought to you courtesy of Springer Nature Customer Service Center GmbH (“Springer Nature”).

Springer Nature supports a reasonable amount of sharing of research papers by authors, subscribers and authorised users (“Users”), for small-scale personal, non-commercial use provided that all copyright, trade and service marks and other proprietary notices are maintained. By accessing, sharing, receiving or otherwise using the Springer Nature journal content you agree to these terms of use (“Terms”). For these purposes, Springer Nature considers academic use (by researchers and students) to be non-commercial.

These Terms are supplementary and will apply in addition to any applicable website terms and conditions, a relevant site licence or a personal subscription. These Terms will prevail over any conflict or ambiguity with regards to the relevant terms, a site licence or a personal subscription (to the extent of the conflict or ambiguity only). For Creative Commons-licensed articles, the terms of the Creative Commons license used will apply.

We collect and use personal data to provide access to the Springer Nature journal content. We may also use these personal data internally within ResearchGate and Springer Nature and as agreed share it, in an anonymised way, for purposes of tracking, analysis and reporting. We will not otherwise disclose your personal data outside the ResearchGate or the Springer Nature group of companies unless we have your permission as detailed in the Privacy Policy.

While Users may use the Springer Nature journal content for small scale, personal non-commercial use, it is important to note that Users may not:

1. use such content for the purpose of providing other users with access on a regular or large scale basis or as a means to circumvent access control;
2. use such content where to do so would be considered a criminal or statutory offence in any jurisdiction, or gives rise to civil liability, or is otherwise unlawful;
3. falsely or misleadingly imply or suggest endorsement, approval, sponsorship, or association unless explicitly agreed to by Springer Nature in writing;
4. use bots or other automated methods to access the content or redirect messages
5. override any security feature or exclusionary protocol; or
6. share the content in order to create substitute for Springer Nature products or services or a systematic database of Springer Nature journal content.

In line with the restriction against commercial use, Springer Nature does not permit the creation of a product or service that creates revenue, royalties, rent or income from our content or its inclusion as part of a paid for service or for other commercial gain. Springer Nature journal content cannot be used for inter-library loans and librarians may not upload Springer Nature journal content on a large scale into their, or any other, institutional repository.

These terms of use are reviewed regularly and may be amended at any time. Springer Nature is not obligated to publish any information or content on this website and may remove it or features or functionality at our sole discretion, at any time with or without notice. Springer Nature may revoke this licence to you at any time and remove access to any copies of the Springer Nature journal content which have been saved.

To the fullest extent permitted by law, Springer Nature makes no warranties, representations or guarantees to Users, either express or implied with respect to the Springer nature journal content and all parties disclaim and waive any implied warranties or warranties imposed by law, including merchantability or fitness for any particular purpose.

Please note that these rights do not automatically extend to content, data or other material published by Springer Nature that may be licensed from third parties.

If you would like to use or distribute our Springer Nature journal content to a wider audience or on a regular basis or in any other manner not expressly permitted by these Terms, please contact Springer Nature at

onlineservice@springernature.com