THEORY AND PRACTICE OF TRANSLATION AS A VEHICLE FOR KNOWLEDGE TRANSFER / THÉORIE ET PRATIQUE DE LA TRADUCTION COMME VÉHICULE DE TRANSFERT DES CONNAISSANCES

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Índice

Avant-propos

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La *Lettre d'Aristée* raconte que le roi Ptolémée II Philadelphus, au 3e siècle avant J.-C., envoya une ambassade au grand prêtre de Jérusalem, nommé Eléazar, afin d'obtenir une copie authentique de la Torah pour la faire traduire en grec. De même, la *Lettre* (*Epistolé*) raconte que le monarque demanda également à Eléazar dans la lettre de lui envoyer les sages qui devaient effectuer la traduction, pour laquelle le grand prêtre choisit soixante-douze sages – six pour chacune des douze tribus d'Israël – qui se consacreraient à cette entreprise fondamentale.

Arrivés à Alexandrie, ils furent reçus par le roi et transférés sur une île qui se trouvait à la périphérie de la métropole, où ils furent séparés dans des tentes individuelles et effectua la traduction en soixante-douze jours. Une fois la traduction terminée, le texte grec fut lu devant la communauté juive de la cité, qui donna son approbation. Les traducteurs, ayant achevé leur tâche, retournèrent à Jérusalem en portant des cadeaux du roi au grand prêtre Eléazar.

L'écriture de la *Lettre* relève, sans aucun doute, de la propagande, dont le but était, d'une part, d'informer sur la traduction du Pentateuque en grec, mais d'autre part – en fait son objectif principal –, de défendre la version de la LXX (Septante) comme traduction fidèle du texte hébreu original. L'histoire du texte de la LXX, marquée par diverses vicissitudes, jouit d'une telle reconnaissance parmi les juifs hellénisés de la diaspora, mais aussi parmi les chrétiens, qu'elle est prise pour une version inspirée.

La lettre aurait été composée à la fin du IIe siècle avant J.-C. Plus de deux millénaires se sont écoulés et pourtant l'acte de traduire et la gloire tant attendue de la survie des traductions continuent de dépendre d'une sorte de *fatum sine causa*. En effet, le chemin incertain par lequel la langue nous emmène, comme le courant d'un fleuve sans destination, permet l'évolution et le réajustement constants de chaque langue pour rendre nécessaire de nouvelles traductions. Les originaux survivent (*manent*), mais les traductions passent (*volant*). Pourtant, les traductions apprécient leurs journées, pendant lesquelles elles peuvent atteindre la gloire ou sombrer dans l'oubli complet. Personne ne peut imaginer quel sort, quel *fatum* attend chaque traduction, quelle

qu'elle soit : celles d'un texte littéraire, juridique, commercial, scientifique... personne ne sait, personne n'est capable de prévoir, de prédire quel sera le sort d'une traduction.

Les traductions se succèdent, comme tout dans la vie. Elles arrivent inévitablement, de manière presque imperceptible, elles sont oubliées, séparées, et leur place est prise par une nouvelle traduction. Mais c'est précisément ce flux constant de traductions qui permet aux textes, et avec eux à leurs idées, de circuler d'un endroit à un autre, d'une culture à une autre, d'un peuple à un autre. Cet exercice éternel de la traduction permet une sorte d'oxygénation des connaissances, une renaissance des idées, une communication naturelle pour ceux qui ne peuvent accéder à l'original. C'est ainsi que les traductions donnent une nouvelle vie au texte traduit et lui permettent de voyager de main en main vers d'autres lieux. Que serait-il advenu de ce monde qui semble mourir sans traductions ? Vous ne pouvez même pas y penser.

De même qu'un texte original, quel que soit le sujet, suscite l'intérêt des lecteurs et des chercheurs, les traductions ont également été dignes de cet intérêt. Les lecteurs dévorent d'innombrables traductions pour le plus grand plaisir du marché de l'édition et bien que de manière plus modeste, mais avec beaucoup d'enthousiasme et d'intérêt, il existe déjà des légions de chercheurs qui s'efforcent de démêler les différentes techniques et stratégies employées par les traducteurs lorsqu'ils passent des originaux à d'autres langues.

Le volume et la diversité des textes qui font l'objet d'analyses et d'études commencent à varier et c'est précisément dans ce contexte que cette publication ouvre de nouveaux chemins, trace de nouvelles voies et méthodes d'analyse pour se plonger dans différents domaines spécifiques de la traduction. Les études qui composent ce volume, comme le montre l'introduction qui suit ces pages, représentent le noble exercice de l'étude de la traduction de ces typologies textuelles, pleines de nuances et de particularités typiques de la langue de l'environnement dans lequel elles habitent. Les articles, très rigoureux, manifestent avant tout une volonté commune et unanime : établir un modèle analytique avec lequel mener des travaux de recherche permettant de connaître les mécanismes de la pratique de la traduction dans ces différents domaines.

Il y a toujours une main qui berce le berceau. Dans ce cas, il y en a trois, car il y a trois éditeurs qui ont réussi à rassembler toutes les œuvres qui composent ce volume: María del Mar Ogea, Carmen Expósito et Francisco Rodríguez, précisément trois spécialistes qui connaissent le monde de la traduction, non seulement parce qu'ils enseignent dans leurs langues de travail respectives (anglais et français), mais parce qu'ils ont développé auparavant une intense activité professionnelle en tant que traducteurs. Leurs mains expertes ont maîtrisé le projet initial qui est devenu le volume actuel, un excellent exemple de l'avenir radieux qui attend les éditeurs et les collaborateurs du volume.

Sapientiæ scientia semper crescat!

Introduction

María del Mar Ogea Pozo
Universidad de Córdoba

The present volume titled *Theory and practice of translation as a vehicle for knowledge transfer/Théorie et practique de la traduction et comme véhicule de transfert des connaissances* explores the fundamental role of translation as channel for the dissemination of knowledge, bringing languages and cultures closer in a diversified world. For that purpose, this book gathers a selection of works that draw attention to the rapidly changing paradigm in translation and how new technologies and practices have revolutionized the research and practice of this discipline. The authors focus on new forms of knowledge transfer and recent research trends, such as interculturality, multimodality, accessibility, postediting, automatic translation, new technologies in translation, and teaching methods.

Regarding machine translation, Franck Barbin discusses quality issues and the relation between neutral MT and human post-editing. For that purpose, the author presents an on-going project which consists in devising a method for researchers that combines a neural MT and human post-editing to improve the quality of article metadata from French to English in the editorial process of journals. This chapter aims to provide a methodology for translation that may be transferred to other journals and disciplinary fields.

A modern form of translation is related to advertising and hypercoded texts, as proved by the study developed by María Cantarero. She delves into advertising campaigns from two main perspectives: business and academia, in order to find out how the new ways of communicating lead to new hybrid genres and discourses used by advertising agents. The author interprets the new advertising on social media and the Internet as a new form of translation, and studies different codes and advertising discourses in several campaigns.

In a chapter devoted to book translation and academia, Gisele Dionísio da Silva offers preliminary data regarding translated books published by Brazilian university publishers and reveals how translation is viewed and exercised in such an institutional scenario. Her study aims to ascertain how the Brazilian scholarly community has been

shaped by specialised knowledge produced in other languages and cultures and, ultimately, to reflect on the current role of translation within academia in times of English as a global lingua franca.

In his study, Juan José Martínez brings forth issues on accessibility related to the media, and delves into audiovisual translation modes such as audio description for the blind and visually impaired. Moreover, the author discusses the key role of humour in media entertainment and explores the rendering of humour in the field of audio description, trying to outline specific features and requirements for that task, such as the presence of sociolects and the many codes of meaning interacting in the audiovisual text.

The next chapter, written by Sylvie Monjean-Decaudin, reveals the interdisciplinary nature of translation and the emergence of juritraductology, offering innovative perspectives for analysis in law and translation studies. Based on the case of the legal term "capitalidad", she demonstrates the methodology of the translation process in three stages: the semasiological stage, the comparative law stage and the onomasiological stage. Then, the author indicates the different possible translations of the legal concept "capitalidad" in French law, while underlining the specificity of the translation of law.

As the title of this chapters stands for, the word is not enough in opera surtitles and new technologies have been implemented to create surtitles for this multisemiotic and multimodal genre. For that reason, Aleksandra Ożarowska focuses on the surtitles provided by the major opera houses and analyses their translations, with the objective of checking which sign systems were qualified as the source text and whether the role of the adjusted surtitles is just preserving the coherence of the non-standard performances or also lending these productions new significance.

Perrine Schumacher and Antonio Sutera identify the differences between human translation and post-editing in an academic context, in terms of target text quality. On the assumption that the post-editing activity of MT has a significant influence on the quality of a target text, the authors show the results of an experimental research conducted among translation students at the University of Liège. They reveal a levelling effect of the post-editing of neural MT in an academic context, and identifies some of the beneficial effects and limitations resulting from the use of using neural MT.

In their contribution, Miriam Seghiri and Miriam Pérez compare the technical terminology related to the automotive field, and more specifically to motorbikes, used in two different textual genres on the same subject. For that aim, the authors compile a virtual corpus, called TECNICOR, made up of two subcorpus: the technical subcorpus MOTOCOR, as well as the legislative subcorpus MOTOLEX. By means of the corpus management tool Sketch Engine, they provide a comparison between the technical terms used in each of the corpora and study their linguistic performance in both textual genres.

A second study on neural translation is performed by Jean-Louis Vaxelaire, who poses the question of what means are needed to obtain a satisfactory result in

machine translation and how neural translation partly manages to meet these requirements. The author proves that, although some forms of specialised translation may be done correctly by software, there will always be a need for human proof-readers and translators for certain areas of expertise, such as medical translation and literary translation. According to the author, the translators' role may change due to technological advances, but there will be still a place for them.

In a study connecting fan translation and language learning, Boris Vázquez-Calvo explains the notion of fan translation is and how fan translation helps fans learn language. The author presents a selection of practical examples of what he terms "multimodal fan translation", which implies manipulating various semiotic modes in the translating of the text. Moreover, he looks into scanlation, fansubbing, fandubbing, and fan translation of videogames, and provides an explanation of the communicative context and purpose of the translation, the sequence of the decision-making process fans adopted to solve the translation problem, and the final solution taken by fans.

In a special contribution, Christiane Nord poses the question about what is actually transferred from a source-culture sender to a receiver located in another culture in the translation process and argues that meaning and sense may be bound to change if an utterance is reformulated in another language and in another situation for another audience. To provide an answer, she discusses the concepts of meaning, sense, and function, using a few examples to illustrate the advantages of a skopos-oriented approach for the theory, the teaching and the practice of translation.

As we may see, this avant-garde approach makes this publication a fruitful and interesting work for scholars, practitioners and researchers focusing on different areas of translation, and who might be willing to find out about the fundamental role of new strategies, technologies, careers, modes and forms of knowledge transfer, and eventually, the future of translation.

Neural MT and human post-editing: a method to improve editorial quality

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Introduction

Artificial intelligence is gradually catching up to human intelligence. Once considered as a myth, it has now turned into a fact (Wu *et al.* 2016: online; Läubli *et al.* 2018: 4791). The development of systems that simulate human intelligence has urged us to take them into account in most fields, including translation studies. Just like when CAT (computer-aided translation) tools were introduced in the 1990s, the translation market faces a new challenge, and translators have to accommodate with this new technological revolution. As anticipated by Perrigaud (2014: online), the development of machine translation (MT) is changing the traditional model in the language industry and accelerates the transition from an economy of products to an economy of services: translators are becoming true consultants in linguistic engineering. They have to reinvent themselves and find their legitimacy in this new process. They must demonstrate their linguistic and disciplinary expertise, and «added value» over such systems (Loock 2018: 787). MT has put increasing pressure on translators, especially since a giant step forward was taken in 2015, when switching from statistical machine translation (SMT) to neural machine translation (NMT) (Yamada 2019: 88). NMT provides better quality translations (more accurate and natural), and becomes closer to human translation (Cho *et al.* 2014: 1724; Sutskever *et al.* 2014: 3111). Hassan *et al.* (2018: online) have even claimed that the translation quality is «at human parity when compared to professional human translations».

Based on an on-going project aiming to develop a replicable methodology of translation for editors and researchers who publish in journals, we intend to reconcile MT and human translation. The project combines NMT and human post-editing

to improve the quality of article metadata (abstracts, keywords, contents, etc.) from French to English in the editorial process of journals.

First, we typically define what MT is and explain the differences between SMT & NMT (statistical vs. neural). We describe the purpose of the project, the role of the different partners, the phases of the project, the constitution of the corpus, and the choice of the MT tool. We examine the methodology used to evaluate the quality of the translations, namely the choice of the assessment grid in phase 1. We finally indicate some of our expectations regarding the results of the project.

1. Machine Translation (MT)

Machine translation (MT) refers to the translation, using a machine, of a source sequence in one language to a corresponding target sequence in another language (Goodfellow 2016: 98). Statistical MT (SMT) and neural MT (NMT) are both data-driven approaches that use parallel corpora, i.e. «original texts and their translations into one or more other languages» (Johansson 2007: 9). A better understanding of how MT works is needed to assess what the added value of human post-editing could be.

1.1. Statistical machine translation (SMT)

Re-introduced in the late 1980s (Brown *et al.*, 1988: 71), SMT uses phrase-based MT (Weaver 1955: 16; Koehn 2010). This type of model provides little linguistic knowledge and relies on the distributional properties of words and phrases in order to make the most probable translation. Brown *et al.* (1993) was the first person who attempted to apply probabilistic methods to machine translation by making a probabilistic machine translation trained on an aligned French-English corpus. These sentence-aligned translations are used to estimate translation probabilities: «Statistical MT systems rely on probabilistic and statistical model of translation process trained on large amounts of bilingual corpora» (Trujillo 1999: 210). McEnery & Wilson (1994: 320) have explained how they work:

> This system chooses the most probable translation sentence in the target language given a sentence in the source language using two probability models: a trigram language model based on three-word sequences, originally developed for a speech recognition system, and a translation model derived from the word-level alignment of their English and French parallel subcorpora and information about word positions within the corpus sentences.

More specifically, the engine can generate multiple translations for one source sentence and select the best one using parallel corpora without going through an interlingua (an intermediate language placed in between the source and the target language). The model is based on three main resources (Labroue 2018: online):

1) A *phrase-table* (or translation model) that produces translation option and their probabilities for phrases (sequences of words).
2) A *reordering table* indicating how words can be reordered (when transferred from source language to target language).
3) A *language model* which gives probability for each possible word sequence in the target language.

All three steps of the process use a database of rules (part of speech, morphological, semantic, constituent, dependency) and lexical items on which the rules apply.

1.2. Neural machine translation (NMT)

Appeared in 2015, NTM represents a «significant step forward» over a basic statistical approach. According to Bahdanau & Cho (2015: online),

> Unlike the traditional phrase-based translation system which consists of many small sub-components that are tuned separately, neural machine translation attempts to build and train a single, large neural network that reads a sentence and outputs a correct translation.

NTM strongly outperforms other approaches and improves translation quality. It consists of three main ingredients.

1.2.1. Word embeddings

Word embeddings are «learned low-dimensional representations of discrete data as continuous vectors» (Koehrsen 2018: online). They help reduce the dimensionality of categorical variables and meaningfully represent categories in the transformed space. They can be seen as a kind of language map: words are grouped by meaning, grammar or semantic commonality, which offers a continuous representation relating words with each other instead of considering them separately.

1.2.2. Attention model

It is also a question of attention capacity. Since one source sentence can be translated in many different ways, the translation function should not be modelled as deterministic, but rather conditional. The first focus should be on the key words at a given stage of translation so as to improve the prediction process. NMT systems should automatically (soft-)search for parts of a source sentence that are relevant to predict a target word. «By letting the decoder have an attention mechanism, we relieve the encoder from the burden of having to encode all information in the source sentence into a fixed-length vector» (Bahdanau & Cho 2015: online).

1.2.3. Recurrent Neural Networks (RNNs)

As NMT systems are attentional encoder-decoder networks, the third ingredient needed is contextual knowledge. Unlike basic neural networks, Recurrent Neural Networks (RNNs) can handle the sequential date, and consider both the current output and the previously received output. They have the ability to memorise previous output due to their internal memory (Mansourbeigi 2020: 485). Just as the human brain would do, NMT systems follow a typical learning process through a training phase: «output is compared with human reference translations during the learning process, and errors are fed back in the system to recalculate weights» (Labroue 2018: online). RRNs learn how to do the translation from data rather than from a set of rules.

In other words, NMT mimics the functioning of the human brain and creates neural pathways to translate a sentence in its entirety. According to Wu *et al.* (2016: online),

> The strength of NMT lies in its ability to learn directly, in an end-to-end fashion, the mapping from input text to associated output text. Its architecture typically consists of two recurrent neural networks (RNNs), one to consume the input text sequence and one to generate translated output text. NMT is often accompanied by an attention mechanism which helps it cope effectively with long input sequences.

One fact is telling regarding the recent progress in deep learning: the increase number of translation companies using MT nowadays. As indicated in the latest EUATC (European Union of Associations of Translation Companies) report published in 2018, only 31% of translation companies never use MT for their services and 22% use it on a daily basis. This development is also being felt on the customer side: an increasing proportion of customers are demanding the use of MT and asking for post-editing services. This trend is expected to increase further in future reports, which is supported by TAUS latest bulletin on the impact of machine translation (2020: online). Unmistakably,

MT is gaining ground in the translation industry in order to meet customers' cost and deadline requirements. The savings generated by post-editing often outweigh the reduction in quality of the final text.

In sum, MT offers a fine-grained analysis of the language, and generates translations that sound more natural and idiomatic, thus bringing consistency, better contextualization and fluency in automated translations. However, MT needs to be refined by human experts in order to meet the linguistic standards of international journals.

2. Project with TRASILT, PUR & MSHB

Our study is based on an on-going project in partnership with the Presses Universitaires de Rennes (PUR, one of the major French publishers), the Maison des Sciences de l'Homme en Bretagne (French Centre for Human Sciences) and the TRASILT team (Translation, Linguistic Engineering and Terminology) within LIDILE research unit (Language, Linguistics and Teaching). This French-funded project, focused on the translation of article metadata, aims to create a replicable semi-automated methodology for high-quality NMT combined with human post-editing. It consists in devising a method for researchers, journal editors and publishers that combines NMT (DeepL) and human post-editing to improve the quality of article metadata (abstracts, keywords, contents, etc.) from French to English in the editorial process of journals. The objective is to develop a methodology for translation that can be reproduced and transferred to other journals and disciplinary fields.

There has been so far a limited number of human evaluations of NMT output (Laübli *et al.* 2018; Loock 2018; Chatzikoumi 2020). Our project intends to fill in this gap by investigating how NMT combined with human post-editing could improve the overall quality of metadata written by non-native English speakers.

We should define what is meant by article metadata and post-editing. The term *metadata*, here in a restrictive sense, includes only the elements intended for translation in journals, i.e. titles (title, subtitle, summary, etc.), abstracts, keywords, author's bionotes, acknowledgements, and editorial notes. The term *post-editing* refers to the activity in which professional translators proofread a text produced by machine translation (MT) and correct it to remove semantic and linguistic errors in order to make it intelligible, accurate and grammatically correct (Allen 2003: 313; Robert 2010: 137).

2.1. Partners

Each partner in this project makes an active contribution, both in terms of expertise and at the institutional level. The MSHB brings their knowledge of the norms and standards

of scientific and technical information. They coordinate the monitoring of the project and act as a relay with competence networks (e.g. Médici, REPERES) and French research organisations (OpenEdition, RnMSH). For their part, the PUR brings their knowledge of publishing and the editorial chains of journal publication. They ensure the pooling and implementation of good practices. The TRASILT team draws on their experience in professional translation and translation studies (translation in the human and social sciences, post-editing, quality assessment, and impact of technology on the quality of technical translations). They thus contribute to the quality assessment of metadata translation and the development of a new translation method for scientific journals. The project is part of the cooperation between the PUR and the MSHB to improve journal practices.

2.2. Experimental Design

The project is divided in three main phases. In phase 1, we compared the previously published (and deemed suitable for improvement) English translation of article metadata with the NMT-generated translation of the same data. This first step was carried out by TRASILT researchers who are also professionally involved in translation and/or revision. This initial evaluation of the quality of the translations via a dedicated grid will then be completed by a phase of NMT post-editing: in phase 2, the metadata of other articles will be post-edited and improved by professional translators. The objective of these first two phases is to determine the qualitative elements and limitations of each output (human vs. NMT), and design a first draft method. In phase 3, the method will be tested in 2021 on one issue of the four selected journals in order to define a reproducible methodology for translating metadata to researchers, journal editors, and publishers.

Our corpus is made up of the metadata of 32 articles published in 2017 in four PUR journals, namely *Annales de Bretagne et des Pays de l'Ouest*, *ArcheoSciences, Éducation & Didactique*, and *Norois*, focusing respectively on history, archaeology, education, and geography. It should be noted that the selected journals are all freely available on OpenEdition Journals, Persée, and the Cairn.info portal.

The choice of articles was primarily determined by the available issues from the publisher: the PUR gave us access to the 2017 issues of the four journals. Our selection was then based on the following criteria. The articles had to belong to the same issue of the journal in order to avoid the arbitrary choice of articles among issues. They had to be written in French—and not in English—so as not to distort evaluation results when assessing the quality of the English translations. They had to present metadata in English; all monolingual productions were therefore discarded. They finally had to deal with diverse subjects so as to offer the widest possible range of terminology. We thus chose sixteen articles published in 2017 in phase 1 of analysis, and sixteen other articles published in 2017 in phase 2 of post-edition. In terms of field representativeness,

we logically selected four articles from the same 2017 issue in each of the four abovementioned journals. In phase 3 of testing, we will choose one issue of each journal to be published in 2021 (probably the last issue of the year in order to allow time to set up this new translation procedure).

2.3. MT Tool

We briefly explain why we chose the neural machine translation system DeepL, and did not create our own MT engine trained on our corpus. The duration of the project (18 months) does not allow for the development of an open source tool, requiring the recruitment of dedicated staff (we do not have the required technical skills in our research team) and the training of the MT engine on a very large specific corpus of aligned bilingual data. We thus decided to resort to a free commercial machine translation tool. We had to keep in mind that the selected MT tool was designed to be easily and freely used by researchers, editors and publishers, mainly in order to translate metadata and not whole research papers. We also relied on the practices, feedbacks and requests from the colleagues of our own university, a vast majority of whom favour DeepL (national survey in progress).

In sum, we chose to use DeepL for the following reasons. First, the quality of the translation provided by this tool is recognized as superior to its direct competitors (mainly Google Translate) in several scientific and professional studies (Burbat *et al.* 2018: online; Macketanz *et al.* 2018: online; Smolentceva 2018: online; Löbert *et al.* 2019: online). Although we agree with Rudy Loock (2019: 787) when he warns about the regularly overestimated performance of these MT engines in the press, we have found that the translation quality produced by DeepL is globally superior to that of its competitors. Without going into details here, we conducted a brief comparative test between DeepL, eTranslation, Google Translate and Systran Translate[1], and DeepL systematically produced translations of better quality and smoother than other MT tools (here for the English/French pair), thus corroborating the results of the aforementioned studies.

DeepL trains their own neural translation networks over billions of high-quality translation segments. It is accessible through a free online version adapted to the needs of researchers, editors and publishers, and already often used by many researchers: a user-friendly MT tool is a key element to ensure a permanent use of our translation method within French journals. The pro version also offers protection of the data communicated: confidentiality of research papers through data encryption, and the absence of document storage on the DeepL server. It also generates fully editable and identically formatted

1. By submitting several summaries of PUR research articles to these four MT tools.

documents, thus facilitating post-editing. This MT engine can also be integrated with computer-assisted translation (CAT) tools that generate translation memories, which allows terminology and phraseology to be reused and harmonised within journals.

DeepL still has some limitations. The personal training is limited to feeding the tool with translations, and any changes made online: all the corrections made to the translations using the DeepL interface are saved by the company and used to train their algorithms. This MT engine does not in any way allow the implementation of specific training adapted to the four fields covered in the selected journals. It cannot be coupled with a glossary or terminology base (TB) specific to a disciplinary field[2]. Finally, you cannot access and therefore customise the source code of the tool.

Table 1. Advantages and drawbacks of DeepL

Advantages	Drawbacks
Near-human translation quality	Limited training
Train their neural networks	No coupling with glossary nor TB
Free online interface suitable for researchers	No access to the source code
Ensure data protection	—
Generate editable documents	—
Easily integrated into CAT tools	—

Despite its limitations, the translation management method that will be implemented will allow free and autonomous use of the software by researchers, journal editors and publishers.

3. Methodology for evaluating the quality of translations

As this study aims to develop a supervised translation method based on machine translation post-editing, and provide optimal linguistic and scientific quality of article metadata in English, we first had to assess existing translations of the metadata and compare them—as objectively as possible—with NMT-generated translations of the same metadata. To this end, we chose to use our proprietary quality assessment grid in phase 1: the TRASILT grid, developed and refined by our research group, is based on

2. A brand new glossary add-on feature allows you to create a glossary (term by term) and apply it to the document being translated.

our experience as professional translators, translation researchers, and translation trainers (Hernández Morin *et al.* 2017).

The widespread use of free online MT has led to an increasing number of studies focusing on end-user tolerance of varying degrees of MT output quality (Bowker *et al.* 2007; Doherty and O'Brien 2014). Paradoxically, MT has both reinstated the use of «absolute» quality standards on the one hand, represented by the reference translation used in metrics-based TQA systems such as the Meteor or BLEU scores, and the relativity of end-user assessments on the other hand, based on simple yes/no acceptability and usability tests (Daems *et al.* 2013).

A review of the existing literature revealed gaps in objective and versatile evaluation tools based on professional criteria (O'Brien 2012: online; Wisniewski *et al.* 2013). Our multi-criteria assessment grid has therefore been developed to try to bring together the most comprehensive evaluation criteria possible in specialised (non-general and non-literary) translation. It aimed to reduce subjective bias as much as possible by establishing clearly defined categories of errors (source of deficiency), differentiating errors from their *effects* on translation (the functional impact of each error on the quality expected), and establishing factors for the *severity* of these effects (the level of functional impact of the error). In addition, quality deficiencies (types of error or error effects) can be weighed differently according to the type of source text and the aim of the target text.

The TRASILT grid (Toudic *et al.* 2014: online) is based on a three-dimensional translation deficiency analysis: (1) error type, (2) effect on quality, and (3) degree of criticality. The grid consists of nine types of possible errors: seven are based on conventional categories (Meaning, Omission/addition, Terminology, Phraseology, Grammar/syntax, Spelling/typography, and Style), and the other two on professional assessment criteria: Localisation errors (i.e. failure to adapt to target audience or culture) and Desktop publishing or DTP errors (i.e. page layout and formatting problems) (table 2).

Four effects on the quality of the translation can potentially apply to each of these identified errors: Accuracy of the information conveyed, Functionality of the translated document, Readability of the content, and Compliance of the translation to the various applicable linguistic or professional standards and conventions.

To avoid centrality bias, a Likert scale of one to three is used to rate the level of functional impact of the error identified, where 0 is having no effect or unaccounted effect, 1 a minor effect, 2 a major effect, and 3 a critical effect. These four levels of criticality are applied to the four types of end-user effects on quality—and not to the nine types of errors, as is the case in most professional assessment models. Our goal is to assess the consequence of the error and not its cause. To avoid dispersion of effect types, the number of effects for a given error is limited to 2, for a maximum of 5 penalty points. Weighting coefficients may be applied to certain types of errors or effects to be

increased, reduced or prohibited depending on the purpose of the translated document or its subject field. This set of quantitative measures boils down to various scores reflecting the level and type of quality of the translation.

Table 2. Error type descriptions in the TRASILT grid

Meaning	Omission/addition	Terminology	Phraseology
Ambiguity	Non translation of a meaningful item of the source document	Inappropriate variant (language variety/ professional usage/ In-house usage)	Inappropriate variant (language variety/ professional usage/ in-house usage)
Partial mistranslation	Unjustified addition of information with a minor impact on the target text	Inappropriate term (belonging to another domain)	Inappropriate phraseology (belonging to another domain)
Complete mistranslation	Unjustified addition of information with a major impact on the target text	Terminological inconsistency (in the document/ with reference material)	Phraseological inconsistency (in the document/ with reference material)
Failure to correct source text deficiency			

Grammar/syntax	Spelling/ typography	Style	Localisation	DTP
Morpho-syntactical errors	Misspelling	Literal translation	Failure to adapt to target culture	Page layout
Word order	Typos	Sentence length	Failure to adapt to target audience	Formatting
Sentence structure	Punctuation error	Lack of fluency	Failure to localise facts and figures	Graphics
	Typography error	Inappropriate register (formal/ informal language)		Tags
		Inappropriate variety (country-specific spelling or word choice)		Cross-references

Table 3. Effect typology in the TRASILT grid.

Accuracy	Usability	Readability	Compliance
Error prevents the correct conveyance of information in the source document	Error prevents correct use of the product, process or document	Error has an impact on the fluency and clarity of the target document	Target document does not comply with language-, country-, culture- or client-specific standards, conventions or recommendations

The Results tab produces totals per error type and functional effect, and total weighted scores. It calculates a *quality ratio* by comparing the total number of errors and the total of weighted scores (depending on the criticality of the effects). The scores obtained are supplemented by general comment on the overall quality of the translation provided by the rater. This comment is supported by the quality ratio, which globally indicates how critical the deficiencies are in the document. According to the ratio obtained, the score appears in green, orange or red. tables 4 to 8 are simply given to illustrate how the TRASILT grid works[3] (table 4).

The finesse of the assessment grid chosen for the project to optimise the translation of article metadata from humanities and social science journals thus allows us to adapt our evaluation to the requirements of English-language publications of article metadata available on platforms such as Cairn.info (2005) or OpenEdition (1999). These platforms expect metadata in English—and potentially in the future in other languages—to be easily identifiable, in order to improve the visibility of articles from French-language journals to a non-French-speaking audience. To do so, the metadata produced must be terminologically accurate and harmonised (abstract terms and keywords consistent within a discipline), and the linguistic quality of the metadata must be sufficient to be published and widely consulted by non-French-speaking researchers.

With this in mind, we started to launch into the first stage of our project: the quality assessment of existing metadata translations and their comparison with the DeepL-generated translations of the same article metadata. The evaluation included two conditions assessed by TRASILT researchers using the TRASILT grid: i) side-by-side ranking (table 4) and ii) error annotation, assessment of the effect(s) of the error, and post-editing. We had to assess in two separate spreadsheets the human translation of the metadata officially published in the four PUR journals in 2017 and the machine translation of the same data

3. The data presented —even though related to the project— are not meant to be discussed in this paper. Indeed, phase 1 is still in progress, and it would be premature to draw any conclusion or comment tables at this stage.

(tables 5 & 6). Each individual evaluation will be compared by at least two raters, who will then agree on the final quality score allocated to each translation (HT vs. NMT) (tables 7 & 8) in order to avoid inter-rater inconsistency (Bojar *et al.* 2016: 145).

Table 4. Side-by-side ranking of an article from *Norois*

Source	Officielle	TA
Le lit endigué de la Loire moyenne : de l'image de fleuve sauvage à la reconnaissance de son caractère anthropisé Les espaces fluviaux font l'objet d'usages diversifiés et en évolution ; cette diversité d'usages, sur des espaces relativement réduits, ne va pas sans conflit et sans poser de problèmes de gouvernance. La Loire a été investie, depuis une trentaine d'années, d'une valeur écologique et patrimoniale qui l'a identifiée comme un fleuve « sauvage », représentation liée à l'absence de grands ouvrages et au déclin des activités traditionnellement fluviales. Ce caractère « sauvage » de la Loire est plus particulièrement attaché à son lit endigué. L'objectif de ce travail est de proposer une démarche pour caractériser la diversité de l'occupation du sol du lit endigué de la Loire moyenne, à partir de la base de données du SIEL (Système d'Information sur l'Évolution du Lit de la Loire), seule base de données incluant les communautés herbacées. La diversité de l'espace inondable a été mise en relation avec ses dimensions longitudinale et transversale, en testant le lien entre l'occupation du sol,	The Diked-up Middle Loire River Bed: From a Wild River Image to the Recognition of its Anthropogenic Character Riparian landscapes show diversified and dynamic land uses ; this diversity in relatively confined spaces involves conflicts and governance issues. Over the last thirty years, the river Loire has been vested with ecological and heritage values which have led to it being defined as a «Wild River». This perception is related to the lack of large dams and to the decline of traditional river activities. This «wild» aspect of the Loire is particularly linked to the diked-up river bed. This work aims to propose an approach to characterize the land cover diversity of the diked-up middle course of the Loire, based on the SIEL database (Information System on the Loire river bed Evolution) which takes into account herbaceous communities. The diversity of the flood area was linked to its longitudinal and cross-ways dimensions by analysing the relationship between land use, based on descriptors of plant communities, and indicators of the upstream/downstream distance and of the width of the	The dammed bed of the Middle Loire: from the image of a wild river to the recognition of its anthropized character River areas are subject to diversified and evolving uses; this diversity of uses, on relatively small areas, does not go without conflict and without posing governance problems. Over the past thirty years or so, the Loire has been invested with an ecological and heritage value that has identified it as a «wild» river, a representation linked to the absence of major structures and the decline in traditional river activities. This «wild» character of the Loire is more particularly attached to its dammed bed. The objective of this work is to propose an approach to characterize the diversity of land use in the dammed bed of the middle Loire, based on the database of the SIEL (Système d'Information sur l'Évolution du Lit de la Loire), the only database including herbaceous communities. The diversity of the floodplain was related to its longitudinal and transverse dimensions, by testing the link between land use, derived from plant community descriptors, and indicators of upstream/downstream

Source	Officielle	TA
issue de descripteurs des communautés végétales, et des indicateurs de la distance amont/aval et de la largeur de l'espace fluvial. Nos résultats montrent que le gradient amont/aval est prépondérant, le lit endigué étant caractérisé par des forêts, prairies et sables à l'aval et par des surfaces artificialisées à l'amont. La largeur du lit endigué est corrélée avec la part de cultures, présentes en proportion non négligeable dans le lit endigué, et localisées de préférence là où le lit est le plus large. Nous mettons en évidence les usages que traduisent certains habitats de cet espace fluvial, qui ne se présente donc pas comme l'espace « sauvage » de certaines représentations sociales.	river and its levees. Our results show that the upstream-downstream gradient dominates, the diked up river showing more forests, meadows and sand downstream and more impervious surfaces upstream. The width of the diked up river is correlated to the proportion of arable areas, a significant part of these being found on the river bed and localized particularly between the levees where the river is at its widest. Through studying the spatial diversity of the diked-up middle Loire, we have highlighted the anthropogenic practices reflected in some of the river's habitats, suggesting it is therefore not such a 'wild' space as depicted in current social representations.	distance and river basin width. Our results show that the upstream/downstream gradient is predominant, with the dammed bed characterized by forests, grasslands and sands downstream and artificial surfaces upstream. The width of the dammed bed is correlated with the proportion of cultures, present in a significant proportion in the dammed bed, and preferably located where the bed is widest. We highlight the uses that some habitats reflect in this river basin, which does not therefore present itself as the "wild" space of certain social representations.
paysage fluvial – occupation du sol – communautés végétales – usages de l'espace – nature.	river landscape – land cover – plant communities – land use – nature.	river landscape - land use - plant communities - land use - nature

Table 5. Grid for HT-generated metadata in an article from *Norois*

LIDILE EA 3874 UNIVERSITÉ RENNES 2 — The TRASILT Grid: a Three-dimensional Translation Quality Assessment Grid for Training, Scientific, and Professional Purposes 								
Choose File	Trads_Norois_1_Di Pietro_FINALE.docx HUMAN TRANSLATION (HT)							
Context	Deficiency	Error Type	Effect on quality (0= no effect/not counted effect, 1= minor, 2 = major, 3 = critical)				Correction	Comments
			Accuracy	Usability	Readability	Compliance		
The diversity of the flood area was linked to its longitudinal and cross-ways dimensions by analysing the relationship between land use,	analysing	Localization	—	—	—	1		inconsistency between UK and US English
The diversity of the flood area was linked to its longitudinal and cross-ways dimensions by analysing the relationship between land use,	cross-ways	Terminology	—	—	1	2	cross-sectional	—
and indicators of the upstream/downstream distance and of the width of the river and its levees and its levees	and its levees	Omissions/ Additions	1	—	—	—		addition
Our results show that the upstream-downstream gradient dominates, the diked up river showing more forests, meadows and sand downstream and more impervious surfaces upstream.	impervious	Meaning	1	2	—	—	industrialized/ artificial	—
suggesting it is therefore not such a 'wild' space as depicted in current social representations.	current	Meaning	1	2	—	—	some	—

Table 6. Grid for MT-generated metadata in an article from *Norois*

LIDILE EA 3874 UNIVERSITÉ RENNES 2 — The TRASILT Grid: a Three-dimensional Translation Quality Assessment Grid for Training, Scientific, and Professional Purposes — CC BY NC ND								
Choose File	Trads_Norois_1_Di Pietro_FINALE.docx MACHINE TRANSLATION (MT)							
Context	Deficiency	Error Type	Effect on quality (0= no effect/not counted effect, 1= minor, 2 = major, 3 = critical)				Correction	Comments
			Accuracy	Usability	Readability	Compliance		
The dammed bed of the Middle Loire	Middle Loire	Localization			2		Middle Loire River	
from the image of a wild river to the recognition of its anthropized character	anthropized	Terminology				1	anthropogenic	
The objective of this work is to propose an approach to characterize the diversity of land use in the dammed bed of the middle Loire	land use	Meaning	2	3			land cover	confusion between the 2 terms land use/land cover
based on the database of the SIEL (Système d'Information sur l'Évolution du Lit de la Loire), the only database including herbaceous communities.	Système d'Information sur l'Évolution du Lit de la Loire	Localization		1	2		SIEL (Information system on the evolution of the Loire bed)	official translation
river landscape	river landscape	Terminology				2	river areas	inconsistency between text and keyword

Table 7. Results tab for HT-generated metadata in an article from *Norois*

Assessment Results			
Document Information		Translator's Information	
Name of the Document	Trads_Norois_1_Di Pietro_FINALE.docx	Translator	
Type of translation	HUMAN TRANSLATION (HT)	Operator Code	FB/GPH
Batch Number	Norois 242	Team	—
Page Numbers	—	Level	—
Number of Words Translated	290	—	—
Number of Words Assessed	290	—	—
Original Language	French	—	—
Target Language	English	—	—

		Effects				
Category	Error Count	Accuracy	Usability	Readability	Compliance	Total
Meaning	6	5	9	0	0	14
Omissions/Additions	8	7	4	0	0	11
Terminology	4	1	0	1	4	6
Phraseology	6	0	0	0	2	2
Grammar/Syntax	3	0	0	0	3	3
Spelling	3	0	0	0	3	3
Style	3	1	0	2	1	4
Localization	3	0	0	0	3	3
DTP	0	0	0	0	0	0
Sub-total	36	14	13	3	16	46
Bonus	0	0	0	0	0	0
Total weighted score	—	—	—	—	—	46

General comment	Quality ratio

Table 8. Results tab for MT-generated metadata in an article from *Norois*

Assessment Results			
Document Information		Translator's Information	
Name of the Document	Trads_Norois_1_Di Pietro_FINALE.docx	Translator	
Type of translation	MACHINE TRANSLATION (MT)	Operator Code	FB/GPH
Batch Number	Norois 242	Team	—
Page Numbers	—	Level	—
Number of Words Translated	278	—	—
Number of Words Assessed	278	—	—
Original Language	French	—	—
Target Language	English	—	—

		Effects				
Category	Error Count	Accuracy	Usability	Readability	Compliance	Total
Meaning	3	2	3	0	0	5
Omissions/Additions	0	0	0	0	0	0
Terminology	3	0	0	0	3	3
Phraseology	1	0	0	0	1	1
Grammar/Syntax	1	0	0	0	2	2
Spelling	1	0	0	0	1	1
Style	2	0	0	3	0	3
Localization	2	0	1	4	0	5
DTP	0	0	0	0	0	0
Sub-total	13	2	4	7	7	20
Bonus	0	0	0	0	0	0
Total weighted score	—	—	—	—	—	20

General comment	Quality ratio

4. Project Expectations

We are using complementary methods of human evaluation in addition to state-of-the-art automatic evaluation metrics, thus expanding the understanding of NMT's strengths and weaknesses compared to those of PBSMT (phrase-based statistical machine translation). Even at this preliminary stage of our project, we should note that fluency is improved, and word order errors are fewer when using NMT, confirming the findings of other recent studies (Castilho *et al.* 2017: 118; Läubli *et al.* 2018: 4792). Fewer segments require post-editing when using NMT, especially due to the lower number of morphological errors. There should be, however, no clear improvement with regard to omission and mistranslation errors when moving from PBSMT to NMT. Our expectation is that NMT would be rated positively for Readability, with possible degradation for Accuracy, Usability and Compliance, especially for longer segments (Cho *et al.* 2014: 1725; Neubig 2017: online). In phase 2, professional translators will be asked to post-edit the MT segments to publishable quality, and then to highlight issues in the MT output. Again, our expectation is that there would be fewer morphology and word order errors with NMT, especially for short segments. Human post-editing should improve contextualisation.

In sum, the NMT output should generally be more fluent and comprehensible, although not without errors (Arthur *et al.* 2016: 1558; Burbat *et al.* 2018: online). Koehn (2020: 19) rightfully reminds us that «[t]he goal of current machine translation research is not to achieve perfect translation but to drive down error rates of machine translation systems». Despite all the recent breakthroughs in NMT, human-computer interaction should still be reinforced in translation, more especially in a scientific environment: «without post-editing by a specialist translator and without the correct specialist terminology, machine-translated texts are not very convincing for a demanding specialist audience» (Ehlion 2019: online). That is why we chose in our translation method for researchers, editors and publishers to combine NMT and human post-editing: «Machine translation followed by post editing done by a qualified, experienced translator can be a good compromise» (Löbert *et al.* 2019: online).

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