1 Introduction

Relatively little has been written on ethics and translation technology, though this is beginning to change. For example, as more general debates on the ethics of artificial intelligence (AI) and machine learning are coming to the fore in other fields of knowledge as well as in the popular media, ethical questions are being broached in the context of recent approaches to machine translation (MT), such as neural machine translation, which utilizes machine learning techniques. Evidence of more attention being paid to the ethics of translation technology can be seen on online discussion forums and blogs for translators, such as posts made by Love (2019) and Pilinu (2019), who explore questions such as “Is MT being funded? Why and by whom?” and “Some ethics for MT related to endangered languages.”

While it is encouraging to see translators begin to engage with questions about translation technology and ethics, the published literature on this topic is partial and fragmented. For instance, while there is a considerable body of work on the ethics of translation, as well as one on computer-aided translation (CAT) and MT, relatively little scholarly literature directly addresses the intersection of the two, though this is starting to change.

Translation has been practiced for thousands of years, but only in recent decades have computer tools become heavily integrated into this profession. While MT research efforts date to World War II, it was only when desktop computers became available in the 1980s that translators started actively using technology by accessing electronic term banks or creating their own term records with early terminology management software (Bowker 2003). However, the use of technologies by translators really began to take hold in the 1990s, with the introduction of commercial translation memory (TM) systems. Momentum continued to grow, and now translators have access to tool suites that integrate a range of technologies from word processors to MT systems. In addition, the advent of free online MT systems, beginning with Google Translate in 2006, means that translation technology is now used regularly by people outside the translation profession (e.g. Bowker and Buitrago Ciro 2019).

Nevertheless, when it comes to technology, the focus in Translation Studies for many years was largely placed on describing tool function and design and on creating “how to” guides. Until relatively recently, there had been less emphasis on the deeper implications of these technologies,
including how they fit within the wider spectrum of cultural, social, political, professional and ethical concerns, and this in spite of the fact that

“[m]any of these questions about ethical aspects of new [translation] technologies are difficult to separate from broader sociocultural issues. Technological developments have occurred alongside, and played a part in, major ongoing shifts in social structures, migration patterns, trade, information and employment.”

(Drugan 2019, 250)

Consequently, as translation technology becomes both increasingly widespread and progressively more embedded in the translation profession and society at large, questions about ethics and technology use are garnering more attention and the associated body of literature is developing. This chapter takes stock of issues pertaining to ethics and translation technologies that have been discussed to date, while also looking to the future by considering some emerging questions.

2 Historical trajectory and tool types

In recent years, translation technology has sparked discussions about ethical questions that touch various aspects of the translation profession, including translators’ professional identity, professional relationships and business decisions. For clarity and ease of discussion, I have tried to separate out different technology-related ethical concerns in the following sections, though in reality, many overlap or are intertwined, such that the same issue may be discussed from multiple perspectives. Additionally, while I have tried to address a range of pertinent questions relating to ethics and translation technology, it would be impossible to provide comprehensive coverage of any given issue in this short chapter. Rather, I aim to provide a glimpse into these important yet still evolving matters, and I hope that this will spur readers to dig deeper and to conduct their own investigations into this relatively under-researched area.

Before discussing the ethical concerns, I give a brief introduction to CAT and MT to help situate readers and allow them to better understand how features of these tools have opened the door to some of the ethical questions that have emerged. Then I present the ethical issues as they relate to translation technologies. With regard to organization, I attempt to present the issues in a roughly chronological order. Ironically, although MT was the earliest translation technology to be developed, it was in relation to the increasing integration of CAT tools in the translation profession that ethical issues were first discussed in earnest. With regard to MT, ethical questions have begun to be raised more frequently in relation to the more recent corpus-based approaches, though as noted earlier, there is certainly overlap and intertwining of many issues.

2.1 Computer-aided translation

CAT tools form a spectrum. At one end, we see office software and basic resources such as term banks, which translators can consult as needed. Towards the other end, we find more sophisticated and comprehensive tool suites (sometimes called workbenches or Translation Environment Tools [TEnTs]), whose components may include term extractors, terminology management systems, concordancers, translation memory systems and sometimes even MT tools, which attempt to automate some part of the translation process and actively suggest options to translators (Bowker and Fisher 2010).

Although these tools are often bundled together and are increasingly able to interact with one another, the core of any such package is arguably the TM system (Bowker and Fisher 2010). A
TM allows users to store previously translated texts and then easily consult them for potential reuse. To permit this, a collection of electronic source and target texts is stored in a TM database in the form of an aligned bitext. This bitext is created by first dividing the texts into segments – usually sentences – and then linking each segment from the source text to its corresponding segment in the translation.

When a translator has a new text to translate, the TM system first divides it into segments and then compares each segment against the contents of the TM database. Using pattern-matching, the TM system tries to identify whether any portion of the new text has been previously translated as part of a text stored in the TM database. When the TM system finds one or more matches (either exact or fuzzy) for a given segment or subsegment, it presents them to the translator. The software does not force the translator to accept the displayed matches; these are offered only for consideration and can, in principle, be accepted, modified or rejected by the translator. Of course, the client or employer may require translators to accept matches, which is an issue that will be discussed later.

Readers looking for an introduction to the most typical CAT tools may consult Bowker and Fisher (2010). For a more wide-ranging exploration of issues related to CAT tools, delve into The Routledge Encyclopedia of Translation Technology (Chan 2015) or The Routledge Handbook of Translation and Technology (O’Hagan 2020).

2.2 Machine translation

As noted previously, though machine translation was the first type of translation technology to be developed, its early incarnations did not generate much discussion about ethical issues. Early approaches to MT are characterized as being “rule-based” because these initial rule-based machine translation (RBMT) systems attempted to process language in a way that resembles how linguists approach the study of language – by following lexical and grammatical rules. Hutchins and Somers (1992) provide a more thorough description of RBMT, but in general, these systems contained large bilingual dictionaries and detailed instructions about how to combine linguistic items to form sentences. Although it was time-consuming and expensive – requiring the development of different MT engines for each language pair and direction – the rule-based approach to MT was the dominant paradigm for nearly fifty years. Only with the advent of corpora (i.e. large collections of machine-readable text) in the 1990s did researchers seriously begin to consider other ways of tackling MT. Having a general understanding of corpus-based or “data-driven” approaches, and how they differ from the rule-based approach, will help readers to better understand why and how these corpus-based systems have sparked conversations about ethics and MT.

An early corpus-based approach to MT was example-based MT or EBMT, which operated in a way similar to the TM systems described previously (Wong and Webster 2015). Essentially, an EBMT system would search a large bilingual parallel corpus to find examples of how particular phrases had been translated previously; it would then recombine the various matches to create a target text. Meanwhile, statistical machine translation (SMT), which became the dominant paradigm in the early 2000s, also used corpora – both monolingual and bilingual – to identify previous translation solutions and to calculate probabilities that a past solution could be appropriate for inclusion in a new translation (Liu and Zhang 2015). Carl and Way (2003) and Koehn (2010) provide more detailed information about EBMT and SMT respectively.

In 2016, another paradigm shift occurred which has seen artificial intelligence and machine learning techniques applied to MT in an approach known as neural machine translation (NMT) (Castilho et al. 2017a). An artificial neural network is an information processing system that is
inspired by the way that biological nervous systems, such as the brain, process information. It is composed of a large number of highly interconnected processing elements that work in unison to solve specific problems. Saffran, Senghas, and Trueswell (2001), who investigate child language learning, have observed that children discover the rules that generate an infinite set using only a finite sample as a reference. Artificial intelligence-based machine-learning techniques face a similar challenge in that artificial neural networks learn by example. An artificial neural network is configured for a specific application, such as pattern recognition, through a learning process. Artificial neural networks are organized in layers, and these layers are made up of a number of interconnected nodes which contain an activation function. Patterns are presented to the network via the input layer, which communicates to one or more hidden layers where the actual processing is done via a system of weighted connections. The hidden layers then link to an output layer where the answer is shown. Artificial neural networks contain some form of learning rule which modifies the weights of the connections according to the input patterns with which it is presented. In this way, artificial neural networks learn by example. The more examples that an NMT system has available for reference, the better the quality of its output; therefore, training corpora are ideally very large (i.e. hundreds of millions of words of parallel text). Language pairs for which relatively few parallel corpora are available are described as low resource languages, and NMT systems built using small corpora tend to produce lower quality texts.

A main difference between NMT and SMT is that when researchers present training material (i.e. corpora) to the deep learning algorithms in an artificial neural network, they do not necessarily tell the algorithms what to look for. Instead, the NMT system finds patterns itself, such as contextual clues around the source sentence. Forcada (2017) provides an accessible introduction to NMT in which he likens the process to predictive text completion: for each word from the source text, the most likely output word is predicted while the target text is being constructed.

Now that I have briefly introduced CAT and MT tools, let us consider some ethical questions that have arisen in relation to them.

3 Core issues and topics

As technologies continue to occupy greater space in translation classrooms, workplaces, and research agendas, they have generated or been accompanied by a complex web of ethical issues, such as ownership of translation resources, privacy and confidentiality of translation data, professional identity of translators, productivity and payment, translators’ codes of ethics, and the potential contribution of tools to linguistic hegemony or linguistic diversity.

3.1 Sharing and commoditization of translation resources

An early discussion of ethics and translation technologies comes from Topping (2000), who wrote about a practical issue arising as a result of TM use: the question of whether TM databases should be shared. The debate at that time involved three groups: individual translators, translation agencies and clients. As Topping (2000) reports, some translators wished to maximize productivity by expanding their TM database collection as quickly as possible and so they advocated for TM database exchange. Meanwhile, agencies argued that sharing TMs would be unethical since clients would not want to have their documentation rendered using a style and terminology similar to that of their competitors. Finally, clients who purchased translation services wanted to protect their intellectual property and investments.

The issue arose again when Zetzsche (2005) observed that TM and terminology databases had acquired the status of “assets.” In particular, clients had become aware of the value of controlling...
these databases: they would not be locked into working with a single language services provider, they could ensure consistency and they could curb costs by paying less for translating segments with database matches. Increasingly, clients began requiring translators to pass on these TM and terminology databases as part of the project deliverables, as well as to insist that these databases be used for future jobs within their own company. However, translators were not permitted to use these databases to do work for other clients.

Twenty years later, Moorkens and Lewis (2020) observe that in many cases, translators’ still do not have any significant control over TM resources. While translators do have legal rights and copyright ownership of both target texts and aligned TM databases, translation industry employment practices often make it challenging for translators to assert their rights. What’s more, the lawyers who drafted the copyright legislation did not predict that translations would go on to be reused to such a large extent, whether in TM tools or as MT training data. Parallel corpus data is now being repurposed in ever-increasing amounts, but broken down to word and even sub-word levels, which are not clearly covered by copyright legislation. Although copyright law continues to evolve, Moorkens and Lewis (2020) note that, to date, there has been no significant impact on the reality of translation data ownership: many freelance translators still feel pressure to hand over their TM databases to agencies or clients because not doing so might affect the translator’s standing with that service provider and cause payment problems.

3.2 Privacy and confidentiality of data

A related problem is that of confidentiality of information when using some translation technologies. According to Kamocki and O’Regan (2016, 4461), using free online MT may entail privacy risks of which users may be unaware and of which MT service providers may be tempted to take advantage. For instance, users may imagine that data entered into a free online MT service simply disappears once the translation process is completed. However, MT service providers may keep this data and reuse it (e.g. as training data). As the capacity and availability of free MT tools expand, so too will the amount of inadvertently disclosed sensitive data. Depending on the nature of their text, users of free online MT sites may need to be concerned about the potential loss of personal or proprietary data or of intellectual property.

Common Sense Advisory, an independent market research firm focusing on language services, has explored the risks associated with entering sensitive information into free online translation tools. According to DePalma (2014), sensitive data can leak in two ways: in transit or at the site. First, the “wrong” people can see information in transit. This issue is not restricted to MT but is a symptom of increasing reliance on web-based services and the cloud. Users make MT requests over unencrypted connections or use open Wi-Fi hotspots that anyone could monitor. This exposes potentially sensitive information to whoever is listening in.

Less often considered is what online MT providers do with the data that users enter. These free online MT providers can use data in ways that users did not intend. While content ownership remains with the creator, free online MT providers may claim usage rights under their terms and conditions. For example, as DePalma (2014) reports, Google notes that it does not claim any ownership in the content that users submit or in the translations of that content that are returned by the MT system. However, by following the policy links, one learns that:

When you upload or otherwise submit content to our Services, you give Google (and those we work with) a worldwide license to use, host, store reproduce, modify, create derivative works (such as those resulting from translations, adaptations or other changes we make so
that your content works better with our Services), communicate, publish, publicly perform, publicly display and distribute such content.

*(cited in DePalma 2014)*

Moreover, the license to use the data continues even after a user ceases to use the service.

### 3.3 Fidelity and collaboration

Another early discussion that focused on how translation technologies are impacting ethics in translation was initiated by Pym (2003), who observes that one significant way in which technologies have changed the translation profession is by facilitating group work. Thanks initially to email and file transfer tools, and then later networked and cloud-based systems, translation projects are increasingly team-based, where shared TM and terminology databases impose collective consistency. Meanwhile, in corpus-based MT, the corpora consist of translations that have been previously produced by other translators. According to Pym (2003), this erodes the very notion of fidelity (to source text, to source author, to the intention of the text or author, etc.) on which a traditional ethics of translation is founded because the team work, or the reuse, means that an individual translator is no longer responsible in any sovereign way.

Crowdsourcing raises similar questions. Although crowdsourcing is not a type of technology per se, it is technology-enabled and cloud-based, and so it merits a brief discussion. Jiménez-Crespo (2018) describes crowdsourcing as outsourcing problem-solving activities and cognitive tasks to large crowds of participants. This has been made possible by new technologies and platforms that allow large groups of people to cooperate at a scale that was previously unimaginable. Early explorations of translation crowdsourcing focused on obtaining translations for free from bilinguals who were not professional translators (see also Chapter 16 “Ethics of volunteering in translation and interpreting” in this volume). However, the use of non-professionals can present problems since unpaid participants have been shown to skip difficult or uninteresting content. Attention next turned to paid crowdsourcing, which Garcia (2015) perceives as a new business model in the translation industry. As with the collaboratively produced TM and MT resources described earlier, crowdsourced translations are the product of multiple contributors and so the ethical question raised by Pym (2003) applies here also.

Pym (2003) argues that technology exacerbates this situation in another way too. While most contemporary theories of ethics require translators to consider a wide range of factors (e.g. source text, target audience, purpose of the translation), tools such as TMs, and to some extent MT, reward consistency and efficiency and instead force translators to reduce translation to the most primitive sense of fidelity imaginable: fidelity to words at the sentence or even the sub-sentence level (because of the segmentation applied to bitexts, as explained previously). A related twist associated with TM and corpus-based MT use is that translators are rewarded for making choices that will not only work (at least to some extent) for the current text but that will also maximize the potential for future reuse (e.g. matches in the TM database) because reuse could increase translators’ productivity.

### 3.4 Professional identity, autonomy and job satisfaction

Several authors, including Stupiello (2008) and Dos Santos (2016), highlight a major risk associated with using CAT tools: the concealing, overshadowing or downgrading of the translator’s contribution. Rather than seeing a translator who interprets a source text’s meaning and intention and renders these in an appropriate target text, clients may perceive the language
professional as a copy editor who simply makes minor revisions to the “real” work that has been largely done by a machine, which has retrieved the correct solutions from its database or corpus. Stupiello (2008) calls for translators to think carefully about hidden ethical costs before leaping to embrace the promises of increased productivity and consistency touted by CAT tools vendors, asking whether speed and consistency are worth the price of having the translator’s perceived contribution downgraded to copy editor of the target text rather than having the translator be recognized as the one who is actually bringing forth the source text’s meaning.

Meanwhile, Kenny (2011) raises a related point in connection with SMT (though her comments apply equally to NMT), noting that, in addition to relying on human translations for training data, SMT also relies on human translation for its legitimacy: the reason that developers train SMT systems with parallel corpora that have been produced by professional translators is because these corpora are assumed to contain good solutions. Moreover, they are assumed to contain good solutions precisely because they contain translations performed by humans. But what exactly is the ethical issue here? The problem lies in the fact that human contributions to the MT process go largely unnoticed. As Kenny (2011, 2) describes, this technology “relies on the ingenuity of both human translators (who produce vital data) and statistically-minded computer scientists (who work out clever ways of using these and other data), and both sets of protagonists might expect to be acknowledged in discussions.”

Meanwhile, Biau Gil and Pym (2006) observe that the way TM systems are being designed by the industry, in an effort to reduce the cost and time required to produce translations, calls to mind the concept of translation as being merely a word-replacement activity. Biau Gil and Pym (2006, 12) argue that translators are often “invited to forget about the other elements configuring the text” and to focus their attention on those segments that might be retrieved from or contributed to TM or terminology databases. This raises an ethical concern about prioritizing current (or future) productivity over quality. The translator’s interpretation of the source text and personal choices made when formulating the target text might be at odds with content management and consistency, even though the translator’s option could be more appropriate for a given context than the option(s) presented by the TM or terminology database. Should the translator prioritize message clarity over the client’s instructions to use the tools and resources?

The issue becomes more complex when, instead of translators actively choosing to use TM (or MT), their agency is denied and they are required by a client or employer to use a tool (or its output). According to LeBlanc (2017, 45), when it comes to translation technology, translators are unsettled not by the tool’s inherent design, but by the shifts in business and administrative practices that sometimes accompany tool implementation. In some cases, the integration of technologies into the workplace has led translation services and service providers to impose guidelines that disquiet translators. For instance, LeBlanc (2013) relays some extreme cases where translators have been instructed by translation agencies or clients not to touch TM matches even if they are erroneous, causing an ethical dilemma that LeBlanc (2017, 45) summarizes as follows:

In the eyes of many translators, some of the new guidelines – most notably, those pertaining to the establishment of productivity requirements and the enforced recycling of previous translations – represent a radical departure from what was done beforehand, and, more importantly, may have an effect on translators’ professional autonomy and their overall professional satisfaction.

Kenny (2019, 437) raises another point worthy of consideration from an ethical perspective. She notes that MT systems have moved from the relatively transparent rule-based approaches, through the diminished transparency of SMT (which though difficult for non-statistically
oriented researchers to understand was still comprehensible in its inner workings), to the total opacity of NMT. Increased opacity is a concern for people that are required to work with NMT systems because it can limit their ability to intervene in translation workflows, thus undermining agendas of translator empowerment (Kenny and Doherty 2014).

With the general improvement in MT output quality that has come with corpus-based approaches to MT, the possibility of post-editing has become increasingly appealing to clients and employers, who often assume that this will be faster and cheaper than translating from scratch. As a result, technology use has emerged as a sort of indicator for dividing the translation market along lines of quality into “premium” and “bulk” translation services (Durban, Hendzel, and Jemielity 2014). The general premise is that premium services, carried out principally by skilled human translators, can command higher prices for their quality-focused work. Meanwhile, the bulk services carried out with the help of MT or CAT tools offer a comparatively low-cost, quick-and-dirty solution that encourages technology-dependent translators to focus on processing large volumes of text to earn a living. Though some take a relatively balanced view that the quality of the translation product that is delivered needs to be fit-for-purpose and accept that some purposes may warrant a lower quality (perhaps as a trade-off for speed or cost), others have been less generous and, in reproaching bulk translation, have gone so far as to denounce translation technology users in the process. For instance, Kelly (2014) refers to post-editing as “linguistic janitorial work,” while Dyson (2003, 11) suggests that for translation tool users, “their technology will label them as bottom feeders, not premium market contenders.”

Contrasting “premium” translators with “bulk” suppliers may come across as condescending and does a disservice to colleagues who strive to deliver what a client has requested or what a user needs. Should it be considered shameful to produce a translation that meets the specifications provided? Nevertheless, it is easy to see how a translator who is labelled as a “bottom feeder” or “linguistic janitor” might have low job satisfaction and questions about their professional identity.

3.5 Lack of technology-related guidance in professional associations’ codes of ethics

Another problem that touches on professional identity is related to the seeming absence of technology-related guidance in professional associations’ codes of ethics. In many countries, professional translators’ associations provide a code of ethics or professional conduct to which their members should adhere (see also Chapter 20 “Ethics codes for interpreters and translators” in this volume). Typically, this code aims to ensure that all members are adopting a common set of ethical principles when they practice their profession. Online discussion forums for professional translators show that they regularly encounter technology-related ethical issues for which they seek peer advice. Perhaps one reason that discussion forums show considerable activity in this regard is because the codes of ethics of many translators’ associations do not address technology-related issues. An investigation by McDonough Dolmaya (2011) in which she examined codes of ethics from seventeen professional translators’ associations from around the world, all of which belonged to the International Federation of Translators, revealed that none of these address the ethical use of technology in translation. According to McDonough Dolmaya (2011, 45), there is work to be done in this regard: “None [of the seventeen codes of ethics] stipulate how translators can make ethical choices with respect to the technology they might need in their practice, yet translators are increasingly using and being asked to use CAT software.”

Although McDonough Dolmaya’s study was conducted before NMT was introduced, this technology will undoubtedly give rise to additional gaps in these codes of ethics.
3.6 Productivity, time and money

Translation technology and money are often discussed together. By speeding information retrieval, reducing the need for revision to ensure consistency and thus increasing productivity, CAT tools are lauded for helping translators to earn more and for helping clients to spend less. Meanwhile increasing attention is being paid to the possibility of post-editing both TM and MT output because studies show that, in some scenarios, post-editing can be more time- and cost-effective than translating from scratch (e.g. Guerberof Arenas 2008). However, as Marshman (2014, 381) points out,

while the claims of increasing language professionals’ income and reducing clients’ translation costs are both reasonable, they are also often mutually exclusive. For example, the reduction in translation costs for clients often results from lower rates (or even no remuneration) for the translation of passages for which translated versions or similar translations already exist.

To complicate matters further, time saved when translating is partially offset by other investments that translators must make. Many CAT tools are expensive and require an investment of time to install and maintain the technologies and in learning how to use them effectively. Meanwhile, professional MT packages (which allow engine tuning and overcome some privacy issues associated with free online systems) may be affordable to some organizations but are typically beyond the reach of individual translators.

In general, the aggressive promotion of the advantages of CAT and MT tools has created a perception that all translation work can be done quickly and cheaply, and it glosses over the hidden costs to the translator. It ignores the fact that even texts with good quality TM matches are likely to need proofreading and editing to be turned into polished translations. Meanwhile, NMT has been lauded for its fluidity, but this in turn masks potential errors of meaning, which can only be caught through attentive reading and comparison with the source text (Castilho et al. 2017b). Faced with this perception, translators may try to explain to the customer that high-quality translation still requires time and money. However, the risk is that the customer will simply seek someone who has fewer qualms about delivering unpolished computer-aided translations for a cheaper price and in a shorter turnaround time.

3.7 Cultural hegemony versus linguistic diversity paradox

As Kenny (2019, 428) notes, there is a long-standing paradox whereby MT appears simultaneously to support the cultural hegemony of English and to contribute to the maintenance of (online) linguistic diversity. However, interest in this situation began to accelerate in the era of corpus-based MT since these systems are easier to develop and deploy. Unlike rule-based MT, which entailed the labour-intensive development of new lexicons and new sets of rules for each language pair/direction, corpus-based MT systems are easier to adapt (essentially, just supply new training material). Moreover, since the launch of Google Translate in 2006, an increasing number of people have been able to access MT for free via the Internet, making translation faster and more affordable. Of course, the more widely spoken European languages are well served by these corpus-based MT systems, while some less widely used languages are not (i.e. if no suitable training corpora are available). However, development continues and new language pairs and even new tools have appeared, such as Baidu Translate (mainly for Chinese) and Yandex.
Translate (primarily for Russian). But does the fact that we can easily access free MT technology mean that we should do so without hesitation?

As Bowker and Buitrago Ciro (2019, 9) describe, in many spheres of activity, English has emerged as the dominant lingua franca of our time. This, coupled with ease of access to free online MT, means that more material is being translated both into and out of English. Bennett (2013) draws attention to the bigger picture and the potential consequences of using English as a lingua franca. Though she does not address MT use in particular, she argues that translation in general has the potential to destroy the epistemological infrastructure of a source text. As Bennett (2013, 171) points out, not only are certain concepts so local that there may not be a translation readily available for them in English, the original text may also be structured according to rhetorical norms that are unfamiliar to those operating in English. In fact, sometimes the discourse used in the source text is embedded in an epistemological paradigm that effectively cannot be mapped directly to the paradigm underpinning equivalent texts in English. In such a case, translating the text inevitably destroys the entire epistemological infrastructure and replaces it with another that is more in keeping with the Anglo-Saxon worldview. Bennett (2013, 171) describes this process as “epistemicidal” because it essentially implies the obliteration of an alternative way of constructing knowledge.

But where is the paradox? Regarding the linguistic diversity and language preservation argument, a new ethical dilemma has emerged in the age of corpus-based MT. As previously explained, corpus-based approaches to MT tend to work better for languages that have large parallel corpora available as training material. Typically, as the size of the training corpus shrinks, the quality of the MT output goes down. Nevertheless, there is understandably an interest in developing MT systems for less widely used languages, often with a view to helping preserve these languages. Researchers working on developing MT systems for less widely used languages are under no illusions about the challenges involved, but they still believe it is a worthy goal and are eager to share their work (e.g. Mager, Gutierrez-Vasques, Sierra, and Meza 2018).

In contrast, several bloggers (e.g. Méchura 2015; Pilinu 2019) have flagged concerns. For instance, in a post entitled “Some ethics for MT related to endangered languages,” Pilinu (2019) requests that MT systems not be made publicly available until they surpass a certain success rate or quality threshold (Pilinu suggests 90% accuracy, though notes there is room for discussion). The reason given for this suggestion is that, instead of helping, it could harm an endangered language if poor-quality texts begin circulating. A similar point is made by Méchura (2015), who describes the situation as follows:

> the role of machine translation is often to “overcome” the perceived “barriers” posed by linguistic diversity. In a minority-language setting, however, we often want the opposite: we want to recreate and reinforce linguistic diversity. Machine translation is counter-productive here: it brings lots of low-quality content into the language (= inadequate translations from the majority language) and it allows original content authored in the minority language to “escape” out of it with ease (= via translation to the majority language), leading to even more domain loss for the minority language.

Pilinu (2019) also observes that many endangered languages have multiple variants, so MT researchers should take care not to focus exclusively on the main variant (which would arguably be the most well-resourced of the variants). “If we are to enhance endangered languages in order to preserve language diversity, we should also take into account that diversity when concerned with a single language,” argues Pilinu (2019).
4 Emerging issues

As noted previously, questions regarding ethics and translation tools were largely overlooked for many years, but they have now firmly caught the attention of the translation community. In this section, I introduce some unfolding issues with regard to ethics and translation technologies.

4.1 Social responsibility

An important emerging ethical issue for various translation stakeholders addresses the theme of social responsibility. As observed by Drugan and Tipton (2017, 119):

> communication across languages and cultures clearly involves important questions for citizens and society at large, and the various participants in translated encounters – interpreter/translator, “client” and “user” – are confronted with broad issues of social responsibility. These issues often arise unexpectedly and with little or no prior training, preparation or opportunity to reflect on appropriate strategies to respond.

How does translation technology fit in? Some discussions from the preceding sections come into play again. For instance, the current technological backdrop raises important questions for translators’ identity and their stake in society. Drugan and Tipton (2017, 121) suggest that participatory cultures enabled by new technologies have given a platform to enthusiastic amateurs, socially committed professionals and (trained or untrained) activists, creating both opportunities and uncertainties (see also Chapter 17 “Ethics of activist translation and interpreting” in this volume). These technologies have also shaped the increasingly fluid professional identity that is reflected in many present-day translator profiles, highlighting the competing tensions facing individuals as they craft their own understanding of what constitute socially responsible working practices in the broader context of their professional and personal life paths.

Moreover, in our information society, the volume and types of global communication needs are pressing translators into service on an unmatched scale and in ways that frequently require reactive, rather than planned, approaches to practice. This has benefits and drawbacks for the profession, simultaneously raising its profile and leading to a proliferation of agents (professional and non-professional, human and machine) that challenges the ethical landscape. As Drugan and Tipton (2017, 121) note, although individuals are increasingly empowered through the availability of translation tools to handle linguistic uncertainty, this entails risk. Citizen translators may use online translation technologies to try to resolve an urgent interlingual crisis (e.g. in a hospital or courtroom), but dispensing with human input in institutional interactions and instead turning to convenient, if imperfect, technology-aided translation solutions breeds new disciplinary and professional imperatives to inform public understanding of the ethical bases of intercultural and interlingual mediation and how these can be managed effectively. Similarly, Bowker (2019) suggests that translators have a social responsibility to help those outside the profession become critical users of free online MT systems.

Using corpora as training data for MT systems raises another question about social responsibility. A recent concern regarding corpus-based MT is that these approaches could suffer from so-called machine or algorithm bias, meaning that they can perpetuate different types of bias (e.g. racial, gender, age) if the training data is not well chosen. As we saw previously, NMT systems “learn” from examples provided in the training corpus, and according to Vanmassenhove, Hardmeier, and Way (2018, 3003), current NMT systems tend to perpetuate a male bias. As summarized by Vanmassenhove et al. (2018, 3003–3004), human translators rely on contextual
information to infer the speaker’s gender and make the correct morphological agreement (e.g. translating “I am happy” into French as either “Je suis heureux” or “Je suis heureuse” according to whether the speaker is male or female). However, most current NMT systems do not take context into account but instead exploit statistical dependencies on the sentence level that have been learned from large parallel corpora. Moreover, sentences are translated in isolation, meaning that information necessary to determine a speaker’s gender might get lost. In such cases, the NMT system selects the option that is statistically the most likely variant; hence the importance of using unbiased training corpora.

This issue was picked up by popular media, who reported that Google Translate’s free online system produced translations that would generally skew toward masculine pronouns for words like “strong” or “doctor” and feminine pronouns for “beautiful” and “nurse.” Google later published two blog posts outlining their efforts to address the problem (Kuczmarski 2018; Johnson 2018).

4.2 Teaching ethics in translation technology courses

There are calls for increased attention to ethics in translation education in general; however, it is unclear how extensively ethical issues are being addressed in translation technology courses. According to Baker and Maier (2011), translation educators have long instructed students to follow professional codes of ethics unquestioningly. Yet, we noted earlier that these codes lack guidance related to technology use. Moreover, some educators have been slow to provide students with the deep understanding of ethical issues that is now called for in this highly technologized profession.

Following the results of their survey revealing that on translation education programs in the United Kingdom, ethics is typically not taught or is offered only in optional courses, Drugan and Megone (2011) argue coherently for integrating ethics education across a translator training program. More recently, Kenny and Doherty (2014) and Kenny (2020) signal a growing need for technology-specific ethical issues to be addressed in translator education. Some discussion of ethics could take place in core technology courses, but as tool use continues to spread beyond technology courses and into translation practice courses, there is a need for technology-related ethics to be addressed more systematically across the curriculum. Depending on course objectives, this may include discussing whether tool use for coursework is appropriate.

4.3 MT and literary translation

For many years, MT and literary translation were rarely uttered in the same breath. However, as MT quality continues to improve, some researchers are investigating the potential of this once seemingly unlikely duo (e.g. Toral and Way 2018). As we wade into largely uncharted territory, Taivalkoski-Shilov (2019) cautions that there are ethical considerations in relation to the applicability of MT to literary translation, though she notes that some issues concern non-literary translation too (e.g. reduced pay for post-editing).

Taivalkoski-Shilov (2019, 692) emphasizes that while “content” and “form” are commonly considered as separate aspects when evaluating translation quality, in literary translation, form is content, thus narrowing the quality scale. Moreover, owing to the inseparability of form and content in literary language, Taivalkoski-Shilov (2019, 694) argues that a translation process that combines MT with post-editing is not suitable for literary translation: because the translation of narrativity requires understanding the source text as a whole as well as in relation to other literary works, the segment-by-segment translation produced by the machine is bound to alter the source text’s meaning and structure.
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Taivalkoski-Shilov (2019, 696) extends her argument, noting that that the inseparability of the literary text’s “content” and “form of content” becomes explicit in relation to voice:

the omnipresence and complexity of voice in literary text creates a great challenge for MT in literary translation. Voice and the way it is partially constructed “between the lines” illustrates well the insurmountable challenges of fully automated, but at the same time high-quality translation of literary text.

4.4 Funding MT research

To our knowledge, translation technology research funding has not been explored in the scholarly literature; however, it figures in a post on the New Zealand Society of Translators and Interpreters’ blog (Love 2019). The post summarizes highlights from the 2018 National Conference of the Australian Institute of Interpreters and Translators at which speaker Sam Berner gave a talk entitled “Ethical Questions for the Age of Intelligent Machines.” Love (2019) found the questions as to whether, why and by whom MT is being funded to be particularly salient:

funding is being put into machine translation research, including by the very universities and education institutes that teach languages and translation – why? Has nobody considered the conflict of interests? In fact, this is against the backdrop of a widespread defunding of language courses at universities and other education institutions.

4.5 Computer-aided interpreting

Finally, while CAT tools are now entrenched in the translation profession, tools to support interpreters are newer. In the context of computer-aided interpreting (CAI), Fantinuoli (2018, 155) distinguishes between setting-oriented and process-oriented technologies, though he recognizes that these form a continuum. Along this continuum are tools such as booth consoles, remote interpreting devices (e.g. tele- and videoconferencing tools) and training platforms, as well as notetaking software and terminology management systems. Braun (2020) extends this list to include more fully automated tools, such as speech-to-text and speech-to-speech machine interpreting technologies. While the CAI literature is relatively recent, Drugan (2019, 250) emphasizes that it will become increasingly important to investigate the ethical implications of emerging technologies in relation to interpreting as tools such as speech recognition and remote–video interpreting are used more widely. As an example, Drugan (2017, 136) cites that challenging issues of judgement can arise when trying to decide if using remote interpreting might be more advantageous than face-to-face encounters, and whether there are cases where it is never appropriate. Finally, as we saw in the discussion of translators’ codes of ethics, the codes of ethics for interpreters must also be amended to take into account new technologies and their application to interpreting.

5 Conclusion

After being virtually ignored during the first fifty or so years of translation technology development, questions addressing ethical concerns are now rapidly pushing to the forefront. While discussions surrounding artificial intelligence and machine learning are among the most visible concerns at the moment owing to wider societal interest in these issues, there are myriad mounting anxieties coming from within the translation community itself which are jockeying for
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Attention and can no longer be easily dismissed. Among others, these include the focus on post-editing of TM/MT output and associated questions of translation quality and remuneration, which have ethical implications for a range of affected parties including translators, language-service providers, tool developers and end-users; the appropriate use and limits of technologies such as CAT, CAI and MT and the associated ethical dimension of human deskilling; the ways in which different players in the production and use of translation have agency, influence or power, and how the growing reliance on technologies is affecting this situation; questions of privacy, confidentiality and ownership of intellectual capital or products; social responsibility surrounding the development and use of translation technologies; and considerations about how best to assist the next generation to engage with the broader question of ethics and translation technologies.

Owing to the rapid development and advancement of new translation tools, coupled with our somewhat late start in reflecting on ethical questions in relation to these technologies, we have some catching up to do! There is no better time than now to begin, and I hope this chapter has provided food for thought.

Related topics in this volume

Professional translator ethics; literary translator ethics; translation and posthumanism; ethics codes for interpreters and translators; ethics in translation industry; ethics in translator and interpreter training.

References


**Further reading**


Given the difficulty of separating discussions of translation technology from their wider social context, Drugan weaves commentaries about technological issues throughout a broader discussion of ethics in translation.

Kenny traces the history of machine translation, outlines the main underlying approaches to MT and explores ethical concerns such as the increasing opacity of MT systems and the relationship between human and machine translation.


Taivalkoski-Shilov considers CAT and MT in relation to literary translation, addressing areas where the tools are seen to be wanting, as well as a case where a poet prefers MT output to human translation, thus challenging the traditional views on the voice of MT and its suitability for literary translation.