An Empirical Investigation into Advantages and Disadvantages of Selected CAT Tools – a Freelance Perspective

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Abstract

This article gives an overview of advantages and disadvantages of computer-assisted translation (CAT) tools, in particular translation memories (TMs) as their main component, and then makes a thorough comparison of two freely available online services. The services used are Google Translator Toolkit (GTT) and Smartcat. A case study is conducted in the field of Computer Science measuring translation time per word with respect to the number and size of additional resources used, and, at the same time, making the effects of the so-called human factors negligible. The services are evaluated from a freelance perspective based on a list of shared and distinctive features and a pairwise comparison of non-functional criteria is made.

Introduction

The advances in the field of information technology in combination with modern communication requirements facilitate the automation of translation processes. Globalization breaks cultural, economic and linguistic barriers and increases the need for communication and understanding. Immediate information availability makes us dependent on the computers and smart devices. Furthermore, new technologies offer more flexibility in trading various products and services. Not only that they are faster, more convenient, and simpler to use, but also more cost-effective. Not knowing a language is nowadays often equated to a limited information access (Delpech, 2014). On the other hand, a sense of affiliation and mother tongue cherishment clashes with the need to understand foreign cultures and people.

Different aspects of modern life brought about the need for more efficient translation methods (Craciunescu, Gerding-Salas, & Stringer-O'Keeffe, 2004). Translation as such became not only too time-consuming but also too expensive. High costs even led to having to settle with low quality translations. The development of information technology, if used up to its full potential, greatly increases productivity and quality. The translators have to acknowledge the benefits that technological developments bring and learn how to use up their potential without feeling threatened (Delpech, 2014). The ways in which the technological developments in translation driven by the two major technological innovations of CAT tools and machine translation (MT) have fundamentally changed communication is discussed in (Doherty, 2016). Despite unprecedented gains in terms of increased translator productivity and consistency, greater global language coverage, and greater support for improving international communication and distribution, the perceived and actual value of translation have changed, along with the awareness and uptake of translation technology and the status and visibility of the profession. CAT tools have changed the relationship between translators and texts. It is beyond a shadow of a doubt that these tools have enabled more flexibility and multidimensional approach to translation.

The core of a CAT tool is a translation memory (TM), a software program that stores translated texts along with their original source texts, so that these pairs can later be reused in full or in part. TM as a purpose-designed translation tool appeared way back in the digital

revolution of the 90s (Garcia, 2009). Second generation TMs apply the principle of translation memory to chunks rather than sentences (Planas, 2005). The author in (Grönroos, 2005) calls this concept of flexible segmenting translation intelligence. TMs are typically packaged with or integrated into additional software that allows translators to manage specialized terminology in a format similar to bilingual glossaries. Along with e-dictionaries, termbanks are nowadays an indispensable part of the translation profession. Dictionaries provide access to concepts, their definitions and translations and sometimes even context and examples of usage. They are useful for storing specific terminology, abbreviations and acronyms, and company related phrases such as slogans, titles, etc., as well as for listing non-translatables, such as personal names. If used with caution, all these resources ensure consistency and quality, and speed-up and simplify the translation process.

Although shared TMs have great potential for leveraging existing translation data, thus increasing productivity, they have been notorious for "sentence salad" (Bédard, 2000; cited in (Doherty, 2016)), "peep-hole translation" (Heyn, 1998), and "blind faith" (Bowker, 2005). The first is due to the over-recycling of sentences and parts thereof which may not suit the context and cohesion of the given text to be translated but are reused by translators nevertheless. This is evident also in (Bowker, 2005), where translators use a series of sentences inconsistent and non-parallel in terms of their style. The second is caused by focusing on text that only appears at the sentence level, while common linguistic devices of cohesion, such as anaphora and cataphora, typically function at the paragraph and document level. The last refers to the tendency to use TM matches non-critically. Moreover, although designed to make the translator's work easier, faster, and more efficient, and to reduce repetitive work, TMs do add different tasks to the workload, such as administering databases (Zerfass, 2002). The author in (Bowker, 2005) also warns about consistency issues when the translation memory is filled up with translations originating from different translators.

Due to the ever increasing availability of computing power, linguistic data, and the growing need for automation, MT began to emerge at the end of 20th century. Up to now, it has undergone two major paradigm shifts. From prescriptive, top-down, rule-based approach, whereby sets of linguistic rules were written manually by linguists and translators for each language pair, it shifted to descriptive, bottom-up, data-driven approach fueled by the availability of the human translation data contained in the TMs. The data-driven paradigm first appeared in the form of statistical MT and since recently in the form of neural MT (NMT). MT is nowadays integrated into majority of CAT tools. With the ever increasing availability of bilingual corpora, data-driven methods even started to be used as an evaluative framework for translation quality assessment (Bowker, 2001). Bilingual corpora can be used to justify and verify choices in the translation process and to assess the severity of translation errors. TMs usually have a bilingual concordance search functionality integrated. A change has been detected not only in the translation technology used to process linguistic data, but also in the overall translation project management systems, since common translation workflow nowadays includes complex projects, a large number of translators which have to be coordinated, either on-site or off-site, and a large number of languages (Doherty, 2016).

This work is motivated by the need for further empirical evidence of the effects that CAT tools have on productivity, as emphasized in (Doherty, 2016). Despite improvements in the quality of commercial MT systems, even the best contemporary MT systems produce errors that require some degree of human intervention, as witnessed in (Doherty, 2016). Moreover, its reliance on human translation data is becoming questionable. Not only that professional translators gradually became more reliant on the tools, but there is also an

explosion of amateur, volunteer translators making use of such tools for translating digital content into many languages and for many purposes (Doherty, 2016). The aim of the paper is to provide a comparison of two online services from a freelance perspective. Smartcat is much more complex and offers advanced functionality compared to Google Translator Toolkit (GTT). Therefore, our assumption is that Smartcat is superior and that its translations have shorter average translation time per word. A case study is conducted measuring translation speed with respect to the number and size of additional resources used. The translation speed is calculated as the ratio of the translation turnaround time and the number of source text words and expressed as the average number of seconds that processing each word takes. The comparison is based on translating Code Club materials for learning how to program. The source texts are selected carefully to illustrate some of the challenges that CAT tools nowadays face. We employ only one translator and one language direction. Since the translator is a double major student of Informatics and English Language and Literature, there is no concern of computer literacy affecting the translation performance. We ensure not only that our translator is familiar with all the involved technologies, but also that he or she has experience in the subject of the translation, and that the volumes of the translation projects are comparable. A pairwise comparison of shared and distinctive features and of non-functional criteria is presented.

The related work is given in the following section. The experimental evaluation of the tools used is given in section 3. The section is divided into subsections on the translator profile, translation tasks, the tools used, and the translation process description. It is followed by a discussion of the results presented and analysis of the features present in either or both of the tools. A short conclusion with directions for future work is given at the end of the paper.

Related work

Different tools available to translators at the beginning of 21st century are reviewed in (Champollion, 2003) and the level of assistance they offer is emphasized. An overview of basic features of TM systems is given in (Zerfass, 2002). The author admits that there is no "one best tool for everything", so the aim of the paper is not to recommend, but to provide guidelines for evaluating TMs with respect to individual requirements. The factors that affect TM use and an evaluation of the most commonly used systems according to functional and non-functional criteria can be found in (Lagoudaki, 2006). The authors in (Shuttleworth & Lagoudak, 2006) list text types ideal for TM use and different scenarios in which TM technology has a particularly clear application.

A time-limited pilot study that investigates the impact of TMs on both speed and quality is presented in (Bowker, 2005). The students are divided in three groups – those who do not use any TM, those who use the original TM and those who use the TM seeded with errors. A pilot study in (Yamada, 2011) investigates the impact of two different versions of a TM database – free vs. literal TMs. All participants translate the same source text but use different TMs. The results show that in the higher fuzzy-match categories, translators using the less literal TM did not gain as much speed as was the case when using a more literal TM. The aim of the research in (Baquero & Mitkov, 2017) is to emphasize one of the shortcomings of TMs which refers to failing to detect synonymous or paraphrased versions of sentences.

The development of TMs from pure to MT-assisted TMs, and, nowadays, to TM-assisted MT is nicely depicted in (Garcia, 2009). Most state-of-the-art CAT tools do allow automatic translation integration. Two ways in which TMs and MT can be combined are discussed in (Zaretskaya, Pastor, & Seghiri, 2015). One way is to include suggestions from an MT engine along with other suggestions. The other is to use both technologies together to enhance the output results and thus increase the productivity and reduce the post-editing effort. However, the authors warn that free publicly available engines do not always satisfy the quality requirements, which is even more true for specialized texts. Moreover, some customers restrict translators from using online MT services because of confidentiality issues. An overview of the MT post-editing research is analyzed in (Eisele, Federmann, & Hodson, 2009), with a focus on comparative advantage that a translator might gain from available toolkits over manual post-editing.

A three use cases of statistical MT are post-editing with the aim to predict whether MT is worth post-editing and to supply post-editors with efficient options; interactive MT with the aim to predict words before they are typed, and TM-MT integration with the aim to integrate TM matches with MT suggestions (Federico, Cattelan, & Trombetti, 2008). A field test is carried out with a commercial MT-assisted CAT tool on two language directions and two domains with 12 professional translators, whereas one translator is restricted to one language direction and one domain. Productivity is measured with post-editing speed and post-editing effort. Half of the documents are translated only by relying on TM matches, and the other half with both TM and MT, whereas maximum MT score is set to 85%. Relative time gains from switching from TM to TM+MT suggestion mode range from 4% to 54% with an average of 27%. An increase in productivity and quality when using MT output as opposed to processing fuzzy matches from TMs is resported also in (Guerberof, 2009). The author uses a supply chain software for the experiment with TM, MT and new segments which are approximately evenly distributed. The processing speed expressed in the number of words per minute is the greatest for MT, then for TM and, lastly, for new segments. The author also shows that faster translator take less advantage of the translation aids than do slower ones.

The productivity increase of statistical MT post-editing as compared to traditional translation for four language directions is evaluated in (Plitt & Masselot, 2010). The paper aims at overcoming specific limitations of other post-editing productivity tests, such as untypical translator profiles, artificial test sets, unreliable time measurements, etc. The QA team examines quality of the selected translations and post-editions, without knowing which is which. The authors report high variance across translators. The throughputs are increased from 20% to 131% and an average of 74%, i.e. MT saves 43% of the time. The benefits of MT also turn out to be greater for slower translators.

As far as GTT is concerned, the authors in (Eisele et al., 2009) believe that it did not succeed to reach the level of usability desired by its users, except for harvesting substantial corrections to the output, which is the bare purpose of its existence. A review of a number of translation tools from the perspective of translation post-editing, GTT being one of them, is presented in (Vieira & Specia, 2011). The authors selected and described toolkits according to a set of criteria, highlighting main differences and similarities between them and also making mention of desirable features that have not been satisfactorily presented by any of the toolkits analyzed.

Due to high variance across translators reported for example in (Federico et al., 2008; Plitt & Masselot, 2010), in this paper we employ only one translator and one language

direction. Moreover, since he or she is a double major student of Informatics and English Language and Literature, there is no concern that her computer literacy will affect her translation performance, as in (Yamada, 2011). We can assume that the student's translation skills are at "near professional" level since the student is an MA graduate of the English Language and Literature with one year of translation experience gained prior to graduation. In this paper MT suggestions are also provided just in addition to TM suggestions and the translator is left free to decide whether to translate segments from scratch or to post-edit the provided matches. The origin of each suggestion, TM or MT, is similarly to (Federico et al., 2008), shown to the user. The source texts are selected carefully to illustrate some of the challenges that CAT tools nowadays face (Doherty, 2016). We strive hard to make the effects of the so-called human factors negligible so we ensure that our translator is familiar with all involved technologies, that he or she has experience in the subject of the translation, and that the volumes of the translation projects are comparable (Kanavos, 2010).

Productivity analysis

Translator

The student who participated in this study is an MA graduate of the English Language and Literature and Informatics with one year of translation experience gained prior to graduation. The student previously completed a course in translation technology where he or she learned to use various both commercial and free CAT tools. We can assume that the student's translation skills are at "near professional" level. Since the student is at a double major study of Informatics and English Language and Literature, her computer literacy is extremely high.

Tasks

The source texts used for this research can be accessed at the Code Club website. They are chosen purposefully to illustrate some of the challenges that CAT tools have to face nowadays, such as domain-specific neologistic terminology, computer code, and different file formats, to name just a few extracted from (Doherty, 2016). Code Club is a world-wide network of clubs lead by volunteers whose goal is to introduce programming to children aged from 9 to 13. GTT is used for translating four documents on HTML and CSS for designing and editing web sites. Two of the documents are projects in pdf format which are first converted into doc format, i.e. „Happy birthday" and „Tell a story", and the other two serve as notes and the format used for notes is html. The projects contain challenges that children need to solve in order to get familiarized with HTML and CSS, while notes include explanations, the resources used, and goals and learning outcomes. The source texts translated by Smartcat cover programming in Scratch – two project converted to a doc format, i.e. „Ghostbusters", and „Space Junk", their respective notes in html, and one project in pdf format, i.e. Cats!". All the documents are in English and they are translated into Croatian, which is the translator's mother tongue.

Tools

GTT is an online text editor which enables editing and sharing translations. It was presented back in 2009. Although originally named Google Translation Center and imagined as a process management system, the Toolkit changed its name and became yet another translation tool (Google Translator Toolkit, 2018.). Google chose to implement a couple of the most important features of the available CAT tools. The user interface is as of 2017 available in multiple languages. Since MT is a basic part of GTT, it can be said that it is actually a TM-assisted MT system (Garcia, 2009).

Smartcat is an online platform aiming at translation agencies and organizations, freelancers (translators, editors and revisers), and localization departments within different companies. The tool was envisaged by the ABBYY company as a CAT tool to be used within translation agencies. Since 2016 it became an independent company. The tool offers three types of accounts: those for freelancers, for translation agencies, and for globalization companies. Besides a 5% fee charged at the end of each project, the service is free of charge.

Unlike with GTT, the functionality of quality assurance (QA), which ensures consistency between originals and translations, is integrated into the tool. For example, if the original sentence contains a full stop, using a comma will activate a warning and an exclamation mark in the orange triangle on the right side of the respective segment. Hovering a mouse over that warning sign or opening a QA check tab gives additional explanation. QA is concerned with spelling, punctuation, terminology, formatting, consistency with a TM, dates and numbers, etc. The precise configuration can be set manually, and crucial warnings can be differentiated from those that can be ignored. The latter affects the translation stage as the segment cannot be labelled as translated under the presence of a crucial warning, and, hence, the project cannot be finished.

Both services used have external integration of MT into CAT and implement real-time processing with MT suggestions as additional suggestions for each segment together with the suggestions from TM and other sources (Zaretskaya et al., 2015). That type of integration proves more efficient and better controlled according to (Kanavos, 2010).

Translation process

The translation pipeline is shown in Figure 1. We decide to measure only translation speed, i.e. post-editing speed in cases where MT suggestions are used, which is expressed in the average number of seconds per word. This indicator directly expresses the time labor required by the translators. The improvements on this indicator, therefore, directly relate to cost savings (Garcia, 2009). User experience is evaluated with a reflective essay. At this point of time we do not measure the translator's effort.

The difference between different parts of experiments is in the number and, hence, volume of the TMs and terminology used. Two project files are translated with GTT and another two with Smartcat without any existing resources. The two supporting files with notes are translated with GTT and the existing TM and glossary of the respective project and one supporting file with notes is translated with Smartcat and the existing TM and glossary of the respective project. Finally, since Smartcat supports simultaneous usage of multiple TMs, one project file is translated with the existing TMs and glossaries of the other two projects, while its supporting notes are translated with all four existing TMs and glossaries – three

project TMs and glossaries and one TM and glossary resulting from the translation of html file with notes.

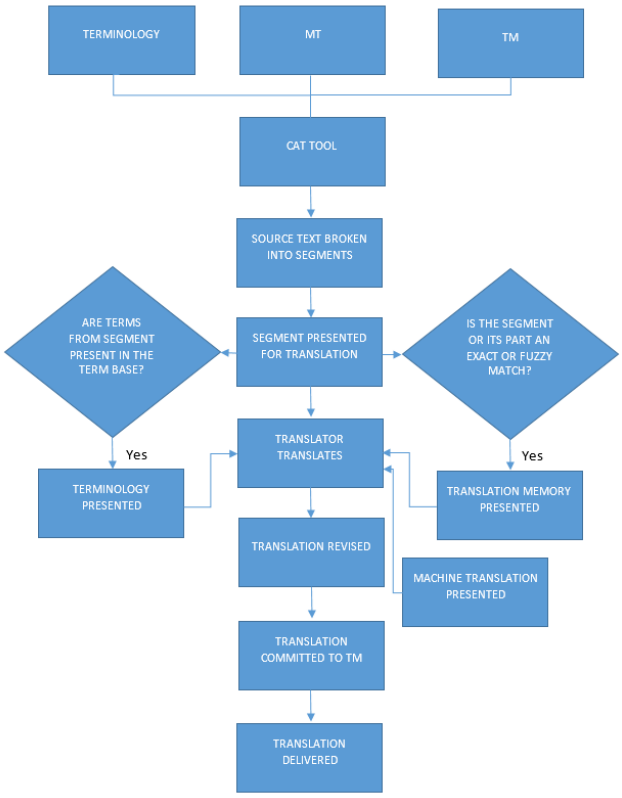

Figure 1 Translation process pipeline (adapted from (Reynolds, 2015))

GTT translation tasks

GTT is used for translating four documents on HTML and CSS for designing and editing web sites. Two of the documents in pdf format, i.e. „Happy birthday“ (HB hereafter) and „Tell a story“ (TS hereafter), are first converted into doc. HB notes (HB(n) hereafter) in html are uploaded from a computer and TS notes (TS(n) hereafter) are loaded via a hyperlink. The statistics is given in Table 1.

Translation of the two project files HB and TS made use only of internal TMs. Both files are converted into doc by an external service which results in translations that have almost five times more pages than their respective originals. Moreover, the resulting documents did not look like their originals with regard to formatting and figure display. Only sporadic figures could be read at all. Upon finishing translation, the projects show only around 75% completeness, probably because figures are not entirely processed by the tool. On the other hand, HTML files are suitable only for translating web pages, since the menus and all such components form an integral part of the original and thus require translation.

The ratio of exact matches for the notes right after upload is between 5 and 6%, while those of fuzzy matches is below 0.02%. The relationship between the translation time per word and machine translated words presented with GTT seems to be expressed by a moderate negative correlation (0.56) (Figure 1). The ratio between MT, TM and glossary matches after the translation task is completed is shown in Figure 2. The translation tasks are presented in a descending order sorted by translation time/word meaning that the translation of HB(n) took

the greatest amount of time per word followed by the translation of TS(n). As already explained, these are tasks which have resources of the respective projects at their disposal. Since the proportion of exact matches and MT content is around 40%, at least for the latter, it may be concluded that the nature of the notes is such that they are harder to translate. The relationship between the percentage of exact matches, fuzzy matches, MT content or terminology suggestions does not seem to exist.

Table 1. GTT text statistics

	Text				Average
	HB	TS	HB (n)	TS (n)	
# of words	1193	960	462	413	757
# of segments	137	112	74	71	98.5
# of figures	20	16	0	0	9
# of repeated words	289	287	11	11	80

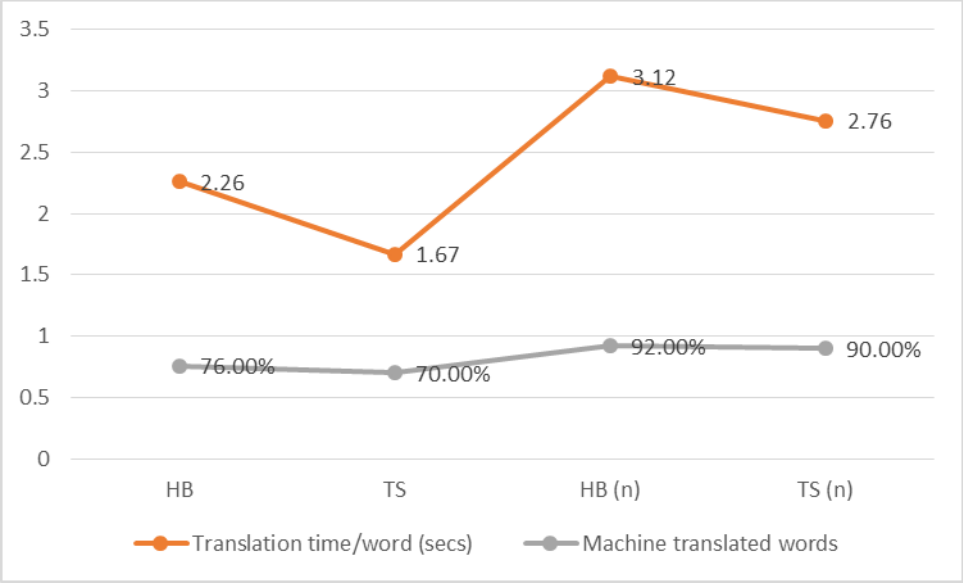

Figure 1. Translation time/word and machine-translated words at the outset of the process

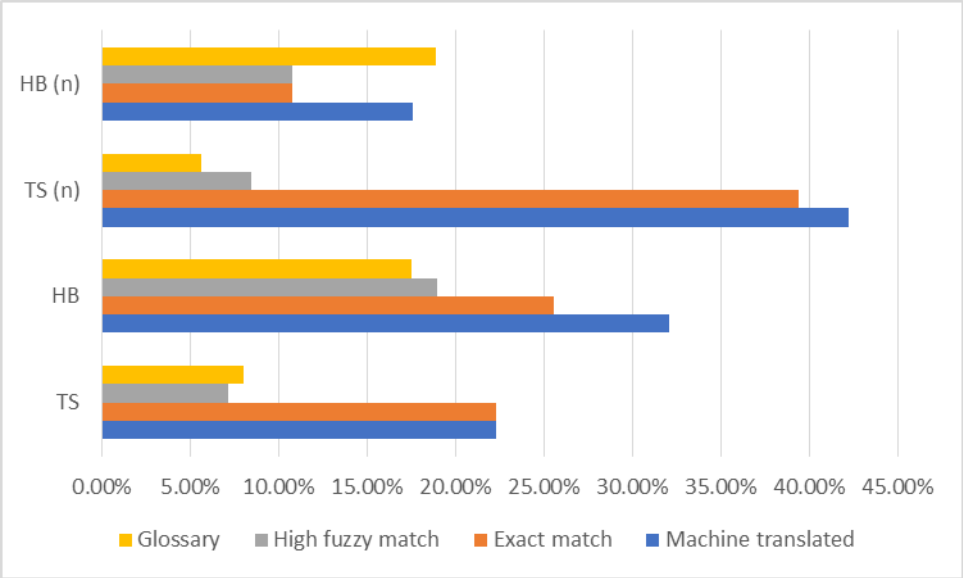

Figure 2. Matches in MT, TM and glossary in a descending translation time/word order

Smartcat translation tasks

Smartcat is used for translating five documents, one in pdf, two converted from pdf into doc, and two html documents. The statistics is given in Table 2. Although Smartcat supports pdf file format, pdf file import succeeded only once, i.e. for the project "Cats" (C hereafter). The other two project files, i.e. "Ghostbusters" (G hereafter) and "Space Junk" (SJ hereafter) in pdf are treated the same way as with GTT, they are first converted into doc and then imported into Smartcat. Unlike GTT, Smartcat extracts text from figures and includes it into the segment list provided that figures are of good quality. A new TM is created for each document, regardless whether an existing TM is used. The ratio between MT, TM and glossary matches after the translation task is completed is shown in Figure 3.

Table 2. Smartcat text statistics

	Text					Average
	G	C	SJ	G(n)	SJ(n)	
# of words	994	1671	1071	222	208	833.20
# of segments	149	296	153	41	42	136.20
# of figures	16	23	23	1	0	12.6

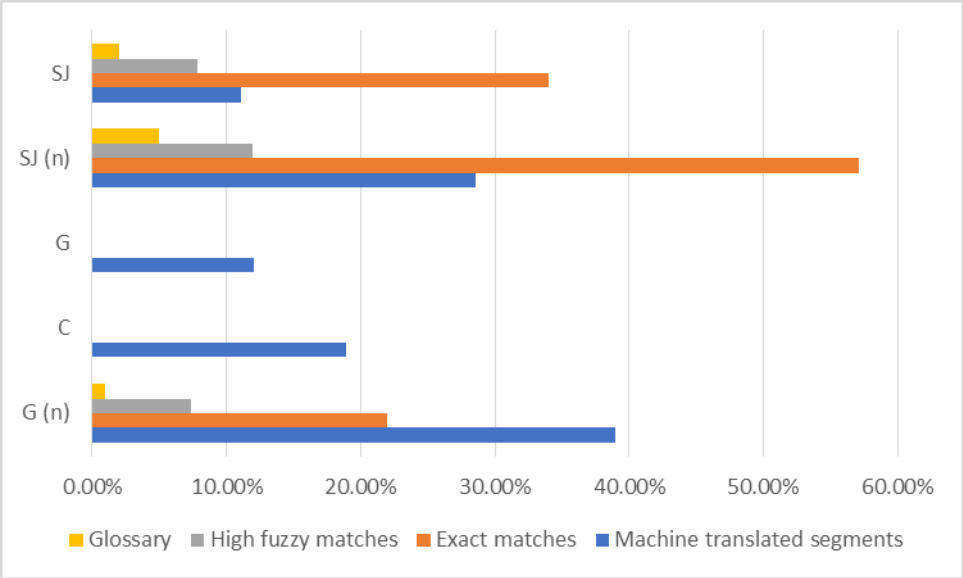

Figure 3. Matches in MT, TM and glossary in a descending translation time/word order

Under the default settings (Table 3), numbers and repeated segments which have already been confirmed are inserted automatically. Awkward segmentation and position of some segmented units can be detected due to pdf-to-doc conversion. For example, one segment contains „when this sprite clicke“, while the next contains only letter „d“. If the segments end up in separate paragraphs, it is not possible to join them. By clicking “Done” all the segments are stored and the project is marked as finished. The resulting translation can be downloaded as an independent doc file or as a bilingual doc file with four columns – ordinal number, original segment, translated segment, and the task which defines whether the segment was translated manually or with the help of a TM or MT.

Table 3. Used functionality per project

Functionality	Translation project				
	G	C	SJ	G (n)	SJ (n)
QA	default	default	Ignore identical segments & partially identical segments	Ignore identical segments & partially identical segments & Multiple	Ignore identical segments & partially identical segments & Multiple

				identical matches & mismatch between TM and target	identical matches & mismatch between TM and target
Existing TM	No	No	Yes	Yes	Yes
Existing glossary	No	No	Yes	Yes	Yes
Automatic pre-translation	No	No	No	Yes	Yes

The highest number of warnings is associated with the project C (Table 4), since this project is loaded into the system as a pdf file. This is also the project with the highest number of segments. A huge number of segments was completely nonsensical.

The settings for the project SJ included working with the two existing project TMs and glossaries, and customized QA options (Table 3), all with the aim to facilitate the translation process, speed it up, and make the final translation consistent with the first two project materials.

The notes of the project G (G(n) hereafter) are translated with the help of the respective project TM and glossary (Table 3). In this project, besides the settings from the previous project (warnings about the identical source and target and about partially coinciding source and target are turned off), automatic pre-translation is used with automatic insertion of dates, numbers, exact TM matches, and MT suggestions (Table 3). Since the project uses the exiting TM, and at the same time stores segments in a newly created TM, warnings about multiple identical matches occur (Table 4).

The notes of the project SJ (SJ(n) hereafter) are translated with the help of all four existing TMs and glossaries (Table 3). Warnings about multiple identical matches have been turned off, as well as warnings about mismatches between TMs and target. The pre-translation options are set as in G(n) (Table 3). Most of the warnings detected in this project were false warnings about misspellings (Table 4). A warning is issued also when a number is translated by a word instead of a number, which is a matter of style and target language convention. Repeated errors are weighted the same as new ones. Even when the translator adds a word to an MT suggestion, the translation is treated as an MT match. In one of the MT suggestions, translation into Russian is detected.

Table 4. Warnings per categories per project

Translation project	# of segments	# of errors per category								Total # of errors
		Tags	Terminology	TM	Dates and numbers	Punctuation	Spelling	Formatting	Other	Total
G	149	0	1	0	3	1	70	0	10	85
C	296	0	4	0	0	19	216	0	29	268
SJ	153	0	2	0	2	3	93	0	0	100
G (n)	41	0	0	41	0	15	33	0	0	89
SJ (n)	42	0	1	0	1	13	18	0	0	33
Total	681	0	8	41	6	51	430	0	39	

Discussion

There is a high correlation (0.89) at 1% level of significance between translation time and the number of words taking all nine translation tasks into consideration.

Using multiple resources did not prove to speed up the translation time per word. Of course, it might be dependent on the nature of the documents. However, TS, which uses no additional resources, turns out to have the best time per word. As far as Smartcat is concerned, only abundant MT suggestions in G (n) seem to bring advantage as far as the processing speed per words is concerned.

A comprehensive list of shared features is shown in Table 5 and a comprehensive list of free account features is contrasted in

Table **6**. Although Smartcat has more advanced functionality and features, e.g. pre-translation, QA, the possibility of using multiple TMs and dictionaries, bilingual document download, project statistics overview, etc., the simplicity of GTT is not always a disadvantage.

Table 5. A list of shared features

Feature
Supported file formats - doc/docx, txt, rtf, html, json, properties, strings, srt
Private and global or shared TMs and glossaries
Displaying segments
Comments to segments
Searching TM and glossary - source side
Formatting tags
Statistics display per document
Project progress display
Splitting and merging segments within the same paragraph
Working offline
Using internal repetitiveness
Exporting a TM

Table 6. A comprehensive list of features

Feature	GT	Smartcat
Interface simplicity	+	-
Interface attractiveness	-	+
Sharing files	+	-
File formats supported	-[1]	+[2]
	+	-

Unlimited file size	-[3]	+
Using multiple TMs	-	+
Turning off MT	-	+
Setting TM threshold	-	+
Searching TM and glossary - target side	-	+
Statistics download	-	+
Quality assurance (QA)	-	+
Setting deadline	-	+
Chat	-	+
Automated payment service	-	+
Tabular data support	-[4]	+
Inserting from a glossary	-	+

As far as QA is concerned, most of the warnings issued in Smartcat are related to falsely-detected spelling mistakes which can be attributed to incompleteness of the glossary that the spellchecker uses. Punctuation error warnings also occur often, especially when there is a hyperlink in the segment. These warning are also often groundless because full stops in hyperlinks do not have to be followed by a space.

One of the disadvantages of GTT is that the possibility of using multiple TMs is limited to downloading them to a local computer and then uploading them to s new TM. However, multiple tries of TM download kept resulting in an error. Another disadvantage is its user interface which is much less attractive compared to that of Smartcat. Furthermore, GTT inserts too many formatting tags which might confuse the translator and badly affect the readability of the segments to be translated. The format of the glossary that GTT supports is non-standard and restricted to csv, while that of Smartcat is either xlsx or xml. While GTT supports only tmx TM format, Smartcat additionally supports also sdltm and xlsx.

One of GTT advantages are superior MT suggestions which can often be simply confirmed without any need for editing. This can be attributed to the facts that TMs can be shared globally and that GT is used worldwide with the possibility of manually correcting MT text and providing feedback to Google. This gives Google access to sentence-aligned parallel corpora which is fed back into its MT engine and an improved engine is trained. Smartcat, on the other hand, offers high quality MT suggestions only for simple words and phrases. Smartcat uses Yandex MT engine and its free service also includes sending corrected translations to Yandex in order to improve it.

Neither of the two tools proved fit for processing doc format files converted from pdf. Smartcat presents some segments in a wrong order and does not successfully load figures containing the text. GTT completely messes up such documents and a ten page document turns out having forty pages. On the other hand, HTML source and target files look completely alike. It is interesting to note that although TM systems very often include the possibility of conducting alignment on existing sources and their translations, neither of the tools presented in this paper offers such functionality. This might indicate that aligning existing translations to make then suitable for recycling does not seem to be worth the effort.

A pairwise comparison of non-functional criteria presented in (Lagoudaki, 2006) speaks in favor of Smartcat. Although it might be scored lower in the learnability dimension, it scores higher in the reliability and usability dimensions.

Conclusion

Numerous tools which are constantly being updated are nowadays available to translators. This paper explores two of the tools of the same type but of quite different complexity. The evaluation is carried out in a real-life setting with one near professional translator. The paper gives a comprehensive list of shared and distinctive features. Since Smartcat has more advanced functionality, i.e. pre-translation, QA, multiple TMs and dictionaries, bilingual document download, project statistics overview, etc., and supports more file formats, an overall evaluation of the tools does confirm our initial assumption that it is superior to GTT. If the only aim is to obtain a fast translation, GTT might be the option of choice. However, user interface and rich functionality decide in favor of Smartcat.

The translation tasks presented in this paper did not manage to highlight advantages of additional resources in terms of translation speed, which is calculated as the ratio of the translation turnaround time and the number of source text words and expressed as the average number of seconds spent per each word. The source texts are selected carefully to illustrate some of the challenges that CAT tools nowadays face. Only one translator and one language direction are employed. In order to make the effects of the so-called human factors negligible, we ensure that our translator is familiar with all involved technologies, that he or she has experience in the subject of the translation, and that the volumes of the translation projects are comparable. The origin of each suggestion, TM or MT, is shown to the translator. The results indicate that the volume of the additional resources is obviously not being able to combat the overhead brought by reading and processing suggestions.

In our future work we might include more translators, TMs and glossaries greater in size, and add another indicator such as translation or post-editing effort. We might also differentiate between post-editing speed and translation speed in order to measure the relative time gain. However, such measurements should be followed up by quality checks as the notion of quality differs per each translator. It yet remains to be seen how different types of MT integration affect productivity. Last but not least, user satisfaction with different integration approaches needs to be evaluated.

Notes:

1 arb, aea, aes, sub

2 xls/xlsx, ppt/pptx, pps/ppsx, pot/potx, odt, odp, php, xhtml, xlf/xliff/sdlxliff/mqxliff/sdlxliff/po/ttx, pdf/mif/idml, dita xml, help + manual xml, xml, Android xml, resx, dtd, json, tjson, yml, imc, inx, mif, jpg/jpeg, tif/tiff, bmp, png, gif, djvu/djv, dcx, pcx, jp2, jpc, .jfif, jb2, ttx, sdlppx/sdlrpx, zip, wsxz
3 document max size 1 MB (exceptiom aea files 25 KB); TM max size 50 MB / 1 GB TMs per year; glossary max size 1 MB / 1 GB glossaries per year
4 tabular data is presented without appropriate spaces

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