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Study on the use of machine translation and post-editing in Swiss-based language service providers

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Abstract

Machine translation and post-editing have been recently attracting attention both from academia and industry, which can be measured by the number of publications, conferences and research projects on the subject. However, information on the use of these practices by language service providers is still scarce. In order to fill this gap, we conducted a survey among Swiss language service providers between June and August 2015. During that period, 16 valid responses were collected from 68 companies that had been identified and contacted. The analysis of the answers revealed that only 2 out of 16 companies were using a machine translation system combined with human post-editing in their translation workflow. More than half of the remaining 14 companies who answered negatively argued that machine translation was not considered a reliable asset. Most of them were not considering using machine translation in the future, or were unsure about it.

Keywords

Post-editing, translation, Switzerland, machine translation

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1. Introduction

Machine Translation (MT) made considerable progress at the beginning of the century, but the use of MT by European language service providers (LSP) was still low at that time (European Commission, 2009, p. 52). It was nonetheless predicted that it would grow substantially in the future due to the continuing exponential rise of translation needs. In the following years, MT took "an irreversible journey" and, by 2014, it was finding "a high adoption rate among language service providers" (Van der Meer & Ruopp, 2014). Recently, several studies have suggested that a combination of MT and Post-Editing (PE) (MT+PE) could result in significant productivity gains (Green *et al.*, 2009; Guerberof, 2009; Specia, 2011; Koponen, 2012; Koehn & Germann, 2014; Laubli *et al.*, 2013). In this rapidly developing context, little is known about the adoption of MT+PE in Swiss-based LSPs: to the best of our knowledge, only one survey (Elia, 2016) has collected data from Swiss LSPs, but due to the reduced number of respondents (4), the answers did not "allow for meaningful analysis at a national level" (Elia, 2016, p. 3) and for this reason were not included in the report. Although Yuste (2002) performed a country specific study on this matter, we cannot discuss or judge its findings because the version of the paper available on the Internet[1] does not include a description of the data obtained in the study.

As collaborators of the Spanish project ProjecTA[2], whose main objective is to provide data that would help to better understand how MT+PE is changing (or not) the way Spanish-based LSPs operate, we decided to conduct a context-specific study targeting the current national Swiss translation market with a view to completing and enriching the original study deployed in Spain. Our study aims were, on the one hand, to determine whether Swiss-based LSPs were making use of MT+PE (and under what circumstances); and, on the other hand, to collect data from the companies that were not using MT[3] or PE, in order to investigate why they did not contemplate their use or were not willing to use them in the future.

The main focus of our study was on Swiss private LSPs, instead of international organisations, cantonal and federal institutions or other private companies with internal translation departments where the use of MT is already described in the literature (for example, Plitt & Masselot, 2010; Pouliquen *et al.*, 2012; Pouliquen, 2013). We also wanted to compare our results with the Spanish study, which focused specifically on the private LSP market. Besides,

[1] The consulted version is available in PDF version at http://www.mt-archive.info/EAMT-2002-Yuste.pdf. Section 3.2 of that paper is missing, and it seems that it should have contained the information on the data obtained (number of respondents, type of company, etc.). In spite of the fact that the summary of findings (section 3.3) does not allow us to infer any information on the number of participants, it is reported that "[w]ith the exception of two leading corporate language service providers who have performed evaluation exercises (Maier, Clarke and Stadler, 2001) of MT systems and adopted one in their workflow, there is no overall interest in MT in the Swiss translation arena." (Yuste, 2002), which correlates with the results obtained in our study.

[2] https://sites.google.com/a/tradumatica.net/projecta/ (last access 30 August 2016)

[3] We specifically asked our participants whether they made use (or not) of an MT system. Therefore, the references to the use of MT refers in our case to that specific concept and does not include other possible scenarios like post-editing of MT provided by the client. However, "post-editing of MT provided by the client" was one of the services that respondents could select in one of the initial background questions regarding the services offered by the company. Interestingly, three companies selected that service: the two companies that later declared to use an MT system (referred in this paper as companies A and B) and one of the companies that stated to have used an MT system in the past (company D) and that also declared not to use MT anymore because clients did not ask for it.

we were truly interested in providing students and researchers with a complete panorama of the use of MT+PE in Swiss LSPs, including their perception of MT+PE today and their access to those technologies.

The structure of the paper is as follows: section 2 describes the survey design and its implementation; section 3 analyses the results of the survey and, when possible, compares them with the results from the above-mentioned project ProjecTA in Spain (Torres Hostench *et al.*, 2016); finally, section 4 provides a summary of the results and some ideas for future research. Appendices 1 and 2 can be consulted at the end of the document.

2. Survey design and implementation

As stated before, this study builds on the Spanish project ProjecTA, whose first initiative was to obtain information on the use of MT by Spanish LSPs through a nation-wide survey that was carried out between January and February 2015[4]. ProjecTA's first draft questionnaire was prepared and sent for discussion to the rest of the international team members. After a period of feedback, redesign and testing, the survey containing the final questionnaire was launched in Spain. Four months later, after the questionnaire had been slightly amended to adjust it to our Swiss specific environment (see next section for further details), the survey was launched in Switzerland and remained active between June and August 2015.

The final questionnaire[5] designed for our Swiss study comprised three main sections:

1. **Contact information**. The name of the respondent, his/her company and contact email were gathered. This information allowed us to internally identify the company and contact it in case any clarification was needed.

2. **Profile and structure of the company**. In this section, we included questions related to the size of the company, year of foundation, annual revenue, type of activity and clientele. All this data allowed us to create a general profile of our participants. This information was also used to compare the results in the next section (Use of MT and PE). This section incorporated some minor modifications compared to the original Spanish survey: in order to get more precise answers from respondents, some categories were split into two (e.g. industry/technological sector) and ranges of numbers were narrowed (e.g. 1–20, instead of 1–40). We also allowed respondents to choose not to answer questions on private information (e.g. revenue). Moreover, we chose a multiple choice format for a number of questions, and added more predefined answers for questions regarding MT, as we considered that this would help respondents reflect on the advantages and disadvantages of using this technology.

[4] Data from 55 LSPs from a total pool of 187 (29.4% response rate) was collected (Torres Hostench *et al.*, 2016, p. 4).

[5] A copy of the questionnaire used in the Swiss iteration in English, German and French can be found at https://drive.switch.ch/index.php/s/VWL0BzF4NqpvZxd. The electronic system used to conduct the survey allowed us to include some advanced logic questions and answers; for that reason, some questions were only applied to some respondents due to the conditions of the respondents' previous answers. For further information on questions' logic and conditions, please consult: https://manual.limesurvey.org/Setting_conditions/en

3. **Use of MT and PE**. This section helped us to gather information on the use of MT and PE. Respondents who declared that they used MT and PE were presented a subset of questions related to their use. On the other hand, respondents who declared that they did not use MT and PE received a subset of questions related to their choice and their willingness to use it in the future. This last subset of questions was not included in the Spanish survey.

The survey was hosted on the limeSurvey server of the University of Geneva and offered in French, German and English. Neither Italian nor Romansh were offered as languages of the questionnaire[6].

The main obstacle we encountered while preparing our study was the identification of Swiss LSPs. In our initial research, 68 companies were identified. We consulted the Swiss Chamber of Commerce through Swissfirms[7], a corporate directory that provides information checked and confirmed by the Chamber, and performed advanced searches by sector and keywords. Further efforts included contacting Swiss associations of translators; however, due to their internal policy and nature (members are translators, not LSPs per se), an internal call for participation could not be processed.

The second step involved reaching the 68 companies that had been identified in the previous phase. As we decided to contact them by email, we used the email addresses found in corporate directories or alternatively searched for them via the Internet. The email we sent can be found in Appendix 2. A reminder was also dispatched approximately every two weeks. A general call for participation using Twitter to spread the word to other possible companies that we might not have identified as such, was also launched.

The survey was officially active between June and August 2015. During that period, 16 valid responses were collected, which represents a response rate of 23.5% (slightly lower than the Spanish study, 29.4%).

3. Results

In this section, we present the data gathered from our 16 participants. The results[8] are presented in two main blocks, (a) profile and structure of the company and (b) use of MT and PE, which correspond to the second and third sections of our questionnaire. A descriptive analysis of the collected data is provided; nonetheless, due to our limited dataset, further inferential analysis such as the correlation between variables could not be conducted. Moreover, when possible and appropriate, comparable results from the Spanish study are discussed.

[6] The questionnaire was offered in French and German because most companies were based in French- and German-speaking cantons. Only one company in an Italian-speaking canton was identified and reached in the initial research phase. English was added as a lingua franca in case the respondent was not a French or German native speaker and/or preferred completing the questionnaire in English for other reasons.

[7] https://www.swissfirms.ch/en/swissfirms/ (last access 30 August 2016)

[8] Due to the data collection method chosen for our study – a questionnaire – our results only refer to the reported use by the companies that participated, not their actual use.

3.1 Profile and structure of the companies

This section provides a summary of the information collected via the second section of the questionnaire. Appendix 1 includes additional tables and figures containing supplementary information on the collected and analysed data.

In terms of **geographical distribution**, we received answers from the following cantons: Geneva (6 companies), Zurich (3), Vaud (3), Neuchâtel (2), Berne (1) and Jura (1). The official languages of those cantons are French (Geneva, Vaud, Neuchâtel and Jura) and German (Zurich and Berne). Companies based in French-speaking cantons represented 75%, whereas companies based in German-speaking cantons represented 25% of the total; a similar proportion was found in the whole dataset of identified companies. The most common **working language combinations** were between German, French and English: German→French (11), English→French (6), French→German (6), and French→English (6). The complete list of answers concerning language combinations can be consulted in Table 4 in Appendix 1.

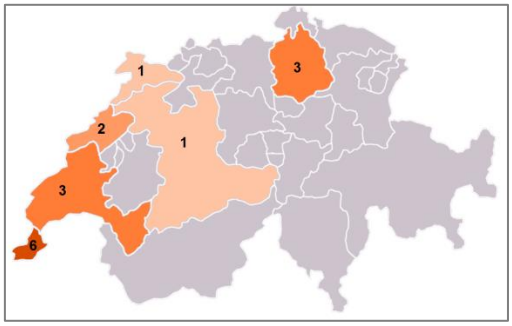

Figure 1. Companies/LSPs distribution by Canton[9]

Concerning the number of **in-house employees**, our set of companies was mainly made up of small businesses or micro enterprises[10]: more than half of the companies (9) declared to have between 2 and 20 in-house employees; a third of the companies (5) had only one in-house employee; one company (1) declared to have between 21 and 50 in-house employees; and another one (1) between 51 and 80. A similar tendency was observed in the Spanish study (Torres Hostench *et al.*, 2016, p. 8): the majority of the companies that participated in it (85.4% of total) could be categorised as micro enterprises (61.8%) and small businesses (23.6%).

When asked about their **annual revenue**, six companies (37.5% of total) declined to provide this information; the same number of companies (6) claimed to have an annual revenue between 100,000 and 300,000 Swiss francs; and four companies (25% of total) declared it to be higher than 500,000 Swiss francs. In terms of **foundation date**, only two companies were founded after 2010; five in the 2000s; seven in the 1990s; and two before 1990 (one in the 1960s and another in the 1970s).

[9] Source of original image: https://en.wikipedia.org/wiki/User:Ojw/Switzerland#/media/File:BlankMap-Switzerland.png

[10] According to the Federal Statistical Office (2016), private businesses can be classified by number of employees: micro enterprise (up to 9), small business (10-49), medium business (50-249), large business (250 and over). Our pre-defined set of answers differed slightly from that classification, as our categories included: 1, 2-20, 21-50, 51-80, 81-100, more than 100.

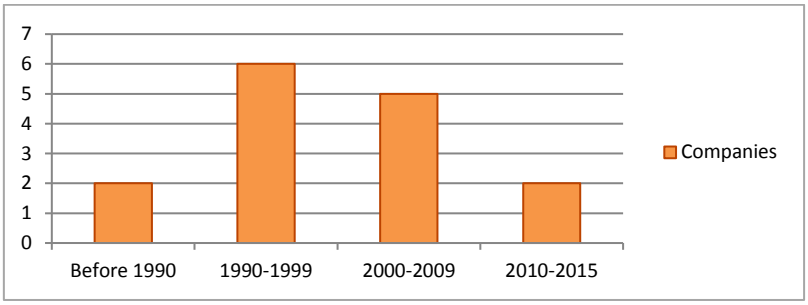

Table 1. Foundation year

Respondents were then asked to select from a list the **translation-related services** that they were offering at the time of the survey. The most popular services were: human translation[11] (offered by 14 companies, 87.5% of total); bilingual reviewing (13, 81.2%); translation memory alignment, creation of terminology databases, and monolingual proofreading (each one offered by 10 companies, 62.5%); terminology database management, and interpreting (each one offered by 9 companies, 56.2%). The complete list of answers can be found in Figure 2. In terms of machine translation, no company selected the option "machine translation", but 3 companies[12] (18.7% of total) selected the more specific option "post-editing of machine translation provided by the client", and 2[13] (12.5%) of those 3 selected the option "machine translation and post-editing".

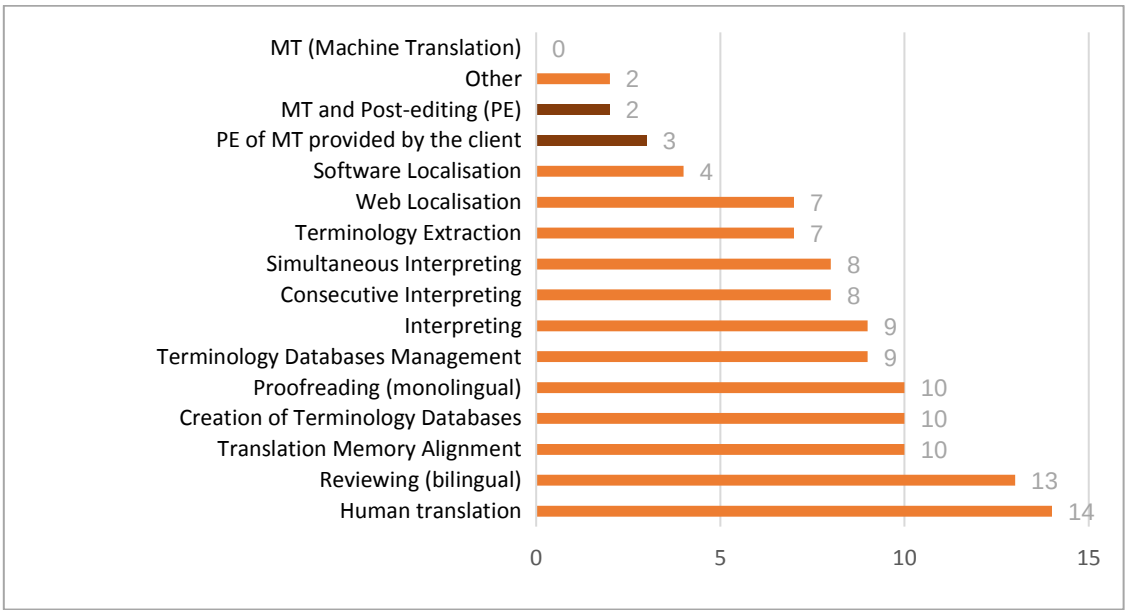

Figure 2. Services offered

Answers from the Spanish study (Torres Hostench *et al.*, 2016, p. 11) were similar to ours in terms of conventional translation services: translation (100% of the companies offered this service), monolingual proofreading (84%) and bilingual reviewing (60%). However, in their

[11] Based on the concept described by Quah (2006, p. 14), in our context, the term "human translation" refers to translation tasks carried out by translators making us (or not) of "some kind of computer-aided translation tool in their work".

[12] In this paper referred to as companies A, B (the two companies that later declared to use an MT system) and D (one of the two companies that later declared to have used an MT system in the past but not anymore).

[13] In this paper referred to as companies A, B (the two companies that later declared to use an MT system).

case, post-editing represented a more popular service, offered by more than half of the companies (55%), and post-editing of machine translation provided by the client was selected by almost a third of the companies (31%).

As for **clientele**, it was comprised of Swiss private companies (15 LSPs selected this answer, 93.75% of total), private clients (12, 75%), Swiss public institutions (10, 62.5%), foreign private companies (7, 43.7%), foreign language service providers (6, 37.5%) and international organisations (5, 31.2%). A complete list of answers is presented in Figure 3.

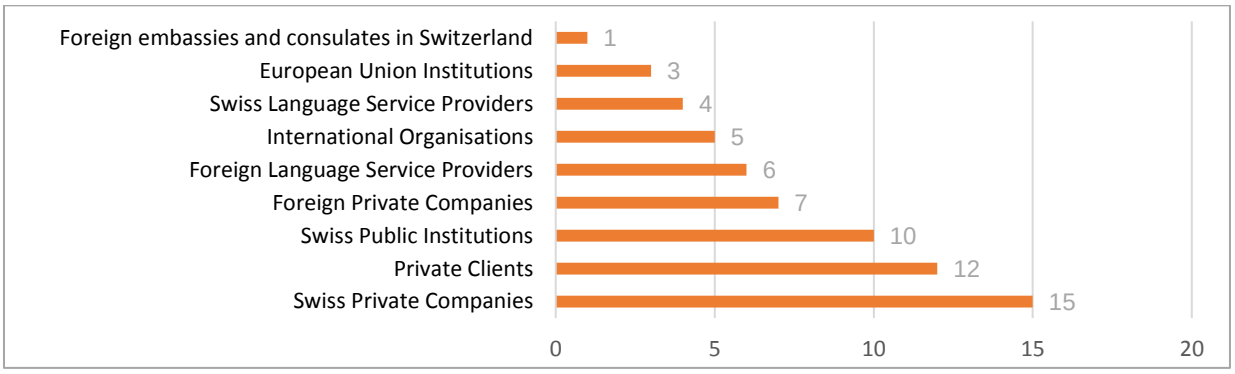

Figure 3. Clientele

In the Spanish study (Torres Hostench *et al.*, 2016, p. 14), the most frequent type of client was also national private companies, selected by 98% of their LSPs. Comparable results were also obtained in the following categories: private companies (64% in the Spanish study and 75% in the Swiss study), public (national and regional) institutions (62% for the Spanish companies, and 62.5% for the Swiss ones), and foreign language service providers (44% for the Spanish companies and 37.5% for the Swiss ones).

However, results between the two studies differ in terms of foreign private companies, which were the second most common client for Spanish companies (82%) or almost double the number in the Swiss study; and in the case of national language service providers (44% for the Spanish companies and 25% for the Swiss companies).

In relation to the **business sectors of the clientele**, finance and industry were the most popular ones (receiving 13 answers both, 81.2% of total), followed by economy (selected by 12 companies, 75% of total), law (11, 68.7%), health (9, 56.2%), and technology and tourism (7, 43.7%). The complete list of answers to this question is included in Figure 4.

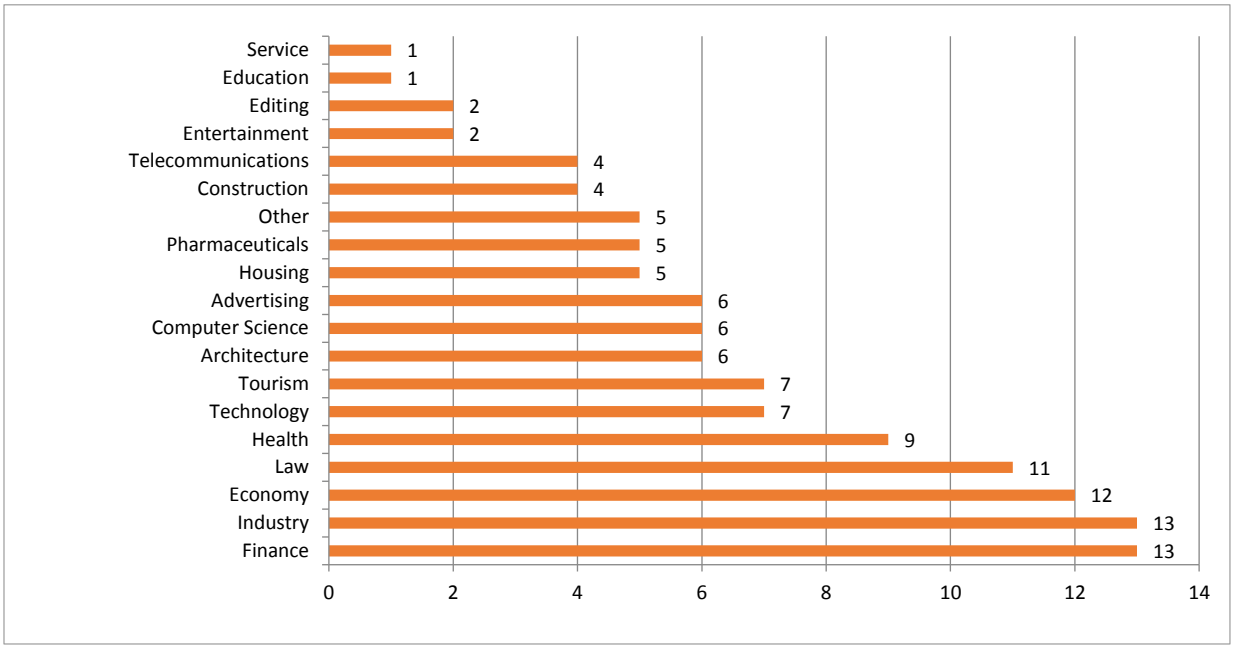

Figure 4. Clients' sectors

If we compare our results with those obtained in the Spanish study (Torres Hostench *et al.*, 2016, p. 15), in general, we observe similar results: the industry[14]/technological sector was selected by 87% of the companies, law (78%), economy[15] (76%), and health/pharmaceuticals[16] (64%). Higher percentages were observed in the following sectors: advertising (78% in the Spanish study and 37.5% in ours) and tourism (67% in the Spanish study and 43.7% in ours).

3.2 Use of Machine Translation and Post-Editing

Companies using MT

When asked whether they used an MT system or not, only two companies (out of 16) answered positively. These two companies (hereafter companies A and B) also affirmed that they used MT for their translation tasks and only one of them (B) affirmed that it used MT for its internal tasks. Company A declared that it used hybrid and statistical systems (not trained for specific texts), and company B, rule-based and statistical systems (trained for specific texts). The language combinations used within their systems were: English→French, German→French and Dutch→French (company A); and German, English, French and Spanish (company B, which indicated the languages used, but not the combinations).

Company A stated that it used MT in a high percentage of its translation work (71-80%); on the other hand, company B declared a much lower MT usage (less than 12%). In both cases, MT output was post-edited by humans. All translators (both in-house and freelance) in company A accepted this paradigm without reservation, and in company B most of them did.

[14] In our predefined set of answers, "industry" was a category of its own (without "technological").

[15] "Finance" and "economy" were two different possible answers in our questionnaire, whereas in the Spanish questionnaire, they were included in a single category.

[16] "Health" and "pharmaceuticals" were two different possible answers in our questionnaire, whereas in the Spanish questionnaire, they were included in a single category. In our case, "health" received more answers (9) than pharmaceuticals (5). In the comparison between countries, we took into account the most selected answer, i.e. "health".

A higher percentage of use of MT was observed in the Spanish study (Torres Hostench *et al.*, 2016, pp. 16-18). In their case, almost half of the companies (47.3%) stated that they used MT in their company's workflow[17]. Nevertheless, almost half of that subset of participants only used MT for a maximum of 10% of their company's work. Further associations between both studies cannot be made due to the reduced number of answers (two companies) from our side. Interested readers may consult the detailed analysis of Spanish companies using MT found in Torres Hostench *et al.* (2016, pp. 16-25).

Companies not using MT

Fourteen companies stated that they did not use any MT system at the moment of the survey, but two of them (hereafter companies C and D) declared that they had used it in the past. Their reasons[18] for not using it anymore were: "clients do not ask for it" (selected by company D), and "MT systems are not reliable" and "MT systems do not improve productivity" (selected by company C). Company C included an additional comment to specify that using MT (as opposed to the use of translation memory systems) is not viable for them as it requires more time to correct poor translations than translating from scratch. Besides, in its final comments to the survey, the company insisted on the idea that translating a text using Google Translate (which is "one of the better available tools") is not a pre-task that simplifies the translator's work and added that MT programmes are mainly useful and acceptable for the final client (who, for example, can obtain an overview of the content of a text and decide whether it is worth requesting a translation), a view shared by the International Federation of Translators (2016). When asked about their willingness to use MT in the future, both companies declared that they were unsure about it.

We also questioned the remaining subset of participants (the twelve companies that had not used or were not currently using MT) about their **reasons for not using an MT** system. From a predefined set of possible reasons, the most frequent reason (selected by 7 out of 12 companies, 58.1% of total) was "MT systems are not reliable", followed by "Our clients do not ask for it" (3), "MT systems do not improve productivity" (3), "the investment effort is too big" (2), and "our translators do not accept to work with MT output" (1). It is interesting to highlight that only one company had ever considered using MT. The complete set of answers (also including companies C and D) can be found in Table 5 in Appendix 1.

Spanish companies not using MT also indicated the unreliability of MT as one of the main reasons[19] (selected by 35.6%) for not adopting this technology, followed by "our clients do not ask for it" (33%) and "our translators do not accept it" (20%), and other reasons (11.1%) (Torres Hostench *et al.*, 2016, p. 19).

The question about the willingness to consider **future implementation** of an MT system was also addressed to this subset of participants. Only one respondent stated that their company would consider using MT in the future. The same company had stated in the previous question

[17] The original question in Spanish was "¿Se utiliza TA en el flujo de trabajo de su empresa?".

[18] The predefined answers for this question were: "Our clients do not ask for it", "Our translators do not accept to work with MT output", "MT systems are not reliable", "MT systems do not improve productivity", "The investment effort is too big", "We have never considered it", and "Other".

[19] Answers from the two studies cannot be directly compared, as in our study, the question allowed multiple choices whereas in the Spanish study, companies could select only one reason.

that they did not use it at the time because the effort was too big. Half of that subset of participants (6) said they would not use MT in the future and five participants said that they were not sure about it.

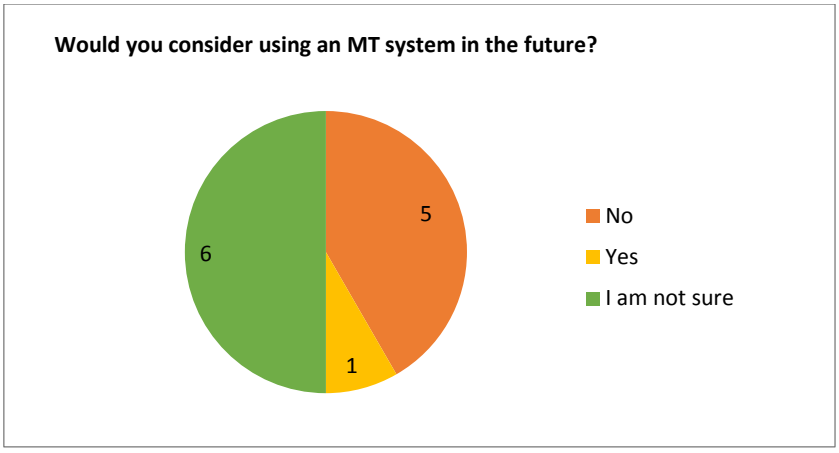

Figure 5. Willingness to use an MT system in the future (answered by the 12 companies that have never used any MT system).

4. Summary and future research

In our poll of results, only two companies (out of 16) stated that they used MT+PE, one using hybrid and statistical systems, and the other, a rule-based and statistical system. The languages most used in those systems can be compared with the most popular languages stated by the whole set of companies: French, German and English. Translators working for those two companies accept mostly without reservation the MT+PE paradigm.

Among the companies that declared they were not using any MT at the time of the survey, two admitted having used it in the past. The main reasons for not using it (taking into account the subset of 14 companies not using MT) were that they did not consider MT to be reliable (7 companies), that they were not being asked by their clients (4) and that they considered that MT did not improve productivity (4).

Our study aimed to join the efforts undertaken by the Spanish funded project ProjecTA (Torres Hostench *et al.*, 2016) and enrich the results obtained in both countries. Although Spain and Switzerland are totally different countries and the size of the analysed datasets differ significantly (the Spanish one is 3.2 times larger than ours[20]), we did find some similar patterns between the results reported by the Spanish and Swiss LSPs that participated in both studies: (a) the size of the companies, as the majority of the companies that participated in each study were micro companies or small businesses; (b) the type of services provided (most of them were conventional services, i.e. translation, monolingual proofreading and bilingual reviewing); (c) private companies were the most common clients in both cases; (d) finance, industry and economy were selected by more than three quarters of the companies as their clients' sectors in both studies; (e) the unreliability of MT systems was selected as the most common reason for not using MT in both studies. On the other hand, the most significant difference found between the two studies was the use of MT systems: almost half of the

[20] The sample sizes were 187 companies in the Spanish study and 68 in ours; the collected answers were 56 in the Spanish study and 16 in ours.

Spanish companies declared they were using this technology, whereas in our case only 12.5% of the respondents (i.e. two companies) stated that they used it.

From the data obtained in our study and our experience conducting it, we can infer the following statements: (a) MT systems and PE are not being widely implemented in the Swiss LSPs that participated in our study, reportedly due to the perceived "unreliability" of MT systems; (b) Identifying and reaching LSPs in Switzerland has been shown to be a complex task; (c) Further studies including other translation agents are needed to determine whether this tendency is applicable to the whole set of translation actors or if a higher percentage (as was observed in Spain) can be found.

The present study aimed to describe and compare the reported use of MT in Spain and Switzerland. It is beyond the scope of this paper to assess whether the reported use is desirable or appropriate and if it should be reconsidered or improved. The desirability and relevance of MT for each type of company could be the subject of further research in this area. In addition, future, projects could attempt to implement other methods that would complement the data collected through a self-reporting method, which has advantages (large geographic scope, data regarding non-observable behaviours, and opinions, assurance of confidentiality and anonymity) but also well-known and inevitable disadvantages that might threaten the reliability and validity of measurement (intentional dishonesty or interest in lying, interpretation of questions, socially desirable responding or biases unrelated to content, such as a tendency to agree with statements) (Letzring, 2008; Prince *et al.*, 2008).

Notwithstanding its limitations, the present study represents a starting point for a more ambitious research effort that could replicate its methodology to gather information regarding other translation actors present in the country. Including more actors and using other complementary methods could give us a broader and more comprehensive overview of the use of MT+PE in translation activities in Switzerland and provide the basis for a case-control and context-based study on the desirability and relevance of MT. Moreover, the unexpectedly low results regarding the reported use of MT and PE among LSPs in Switzerland as well as in Spain shows that more studies from other countries on the use of MT and PE among LSPs are needed.

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5. References

Elia (2016). *Language industry survey: Expectations and concerns of the European language industry*.

European Commission (2009). *The size of the language industry in the EU*. Studies on translation and multilingualism.

Federal Statistical Office (2016). Statistique suisse. Classes de taille des entreprises. Retrieved August 30, 2016, from http://www.bfs.admin.ch/bfs/portal/fr/index/themen/06/11/def.html

Green, S., Heer, J., & Manning, C. D. (2013). The efficacy of human post-editing for language translation. *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 439-448). ACM.

Guerberof, A. (2009). Productivity and quality in MT post-editing. *MT summit XII proceedings. Workshop: Beyond translation memories: New tools for translators*.

International Federation of Translators (2016). *FIT position paper on machine translation*. Retrieved March 1, 2017, from http://www.fit-ift.org/position-statements/

Koehn, P., & Germann, U. (2014). The impact of machine translation quality on human post-editing. *Workshop on humans and computer-assisted translation* (pp. 38-46).

Koponen, M. (2012). Comparing human perceptions of post-editing effort with post-editing operations. *Proceedings of the seventh workshop on statistical machine translation* (pp. 181-190).

Laubli, S., Fishel, M., Massey, G., Ehrensberger-Dow, M., & Volk, M. (2013). Assessing post-editing efficiency in a realistic translation environment. *Proceedings of the MT summit XIV workshop on post-editing technology and practice* (pp. 83-91).

Letzring, T. D. (2008). Self-report methods. In *The International encyclopedia of the social sciences* (2nd ed.). Detroit, MI: Macmillan Reference USA. Retrieved September 1, 2017, from http://www.encyclopedia.com.

Maier, E., Clarke, A., & Stadler, H. U. (2001). Evaluation of machine translation systems at CLS Corporate Language Services AG. In B. Maegaard (Ed.), *Proceedings of the MT Summit VIII – Machine translation in the information age. Santiago de Compostela, Spain.* 18th–22nd September 2001 (pp. 223-228). European Association for Machine Translation.

Plitt, M., & Masselot, F. (2010). A productivity test of statistical machine translation post-editing in a typical localisation context. *The Prague Bulletin of Mathematical Linguistics, 93,* 7-16.

Pouliquen, B., Mazenc, C., Elizalde, C., & Garcia-Verdugo, J. (2012). Statistical machine translation prototype using UN parallel documents. *16th Annual Conference of the European Association for Machine Translation (EAMT 2012)* (pp. 12, 19).

Pouliquen, B. (2013). Translation assistant for patent titles and abstracts in PATENTSCOPE – potential use in translating IPC definitions. *International Patent Classification (IPC) Workshop*.

Prince, S. A., Adamo, K. B., Hamel, M. E., Hardt, J., Connor Gorber, S., & Tremblay, M. (2008). A comparison of direct versus self-report measures for assessing physical activity in adults: A systematic review. *Int J Behav Nutr Phys Act*, *5,* 56.

Quah, C. K. (2006). *Translation and technology*. New York: Palgrave Macmillan.

Specia, L. (2011). Exploiting objective annotations for measuring translation post-editing effort. *Proceedings of the 15th Conference of the European Association for Machine Translation* (pp. 73-80).

Torres Hostench, O., Presas, M., & Cid-Leal, P. (2016). *El uso de traducción automática y posedición en las empresas de servicios lingüísticos españolas: informe de investigación ProjecTA 2015*. Bellaterra.

Van der Meer, J., & Ruopp, A. (2014). *Machine translation market report*. TAUS BV, De Rijp, the Netherlands.

Yuste, E. (2002). MT and the Swiss language service providers: An analysis and training perspective. *Sixth EAMT Workshop. Teaching Machine Translation* (pp. 14-15). Retrieved August 16, 2016, from: http://www.mt-archive.info/EAMT-2002-Yuste.pdf.

Appendix 1. Additional Tables and Figures

Employees	Companies	%
1	5	31.25%
2-20	9	56.25%
21-50	1	6.25%
51-80	0	0.00%
81-100	1	6.25%
More than 100	0	0.00%

Table 2. In-house employees

Revenue (in Swiss francs)	Companies	%
Less than 100,000	0	0.00%
100,000-300,000	6	54.55%
300,001-500,000	0	0.00%
More than 500,000	4	36.36%
I do not wish to answer this question	1	9.09%
I do not know	0	0.00%
No answer	5	31.25%

Table 3. Annual revenue

Language combination[21]	LSPs
DE-FR	11
EN-FR	6
FR-DE	6
FR-EN	6
EN-DE	5
DE-EN	4
DE-IT	3
DE-PT	2
EN-RU	2
RU-EN	2
FR-ZH	2

Table 4. Language combinations

[21] Other language combinations selected by just one company included: NE-FR, IT-DE, DE-ES, ES-DE, DE-EO, EO-DE, PT-DE, DE-AR, FR-RU, RU-FR, FR-IT, ES-EN, PT-FR, FR-PT, DE-ZH, DE-TH, DE-RU, DE-NL, DE-SV, DE-NV, DE-HU, and DE-PL.

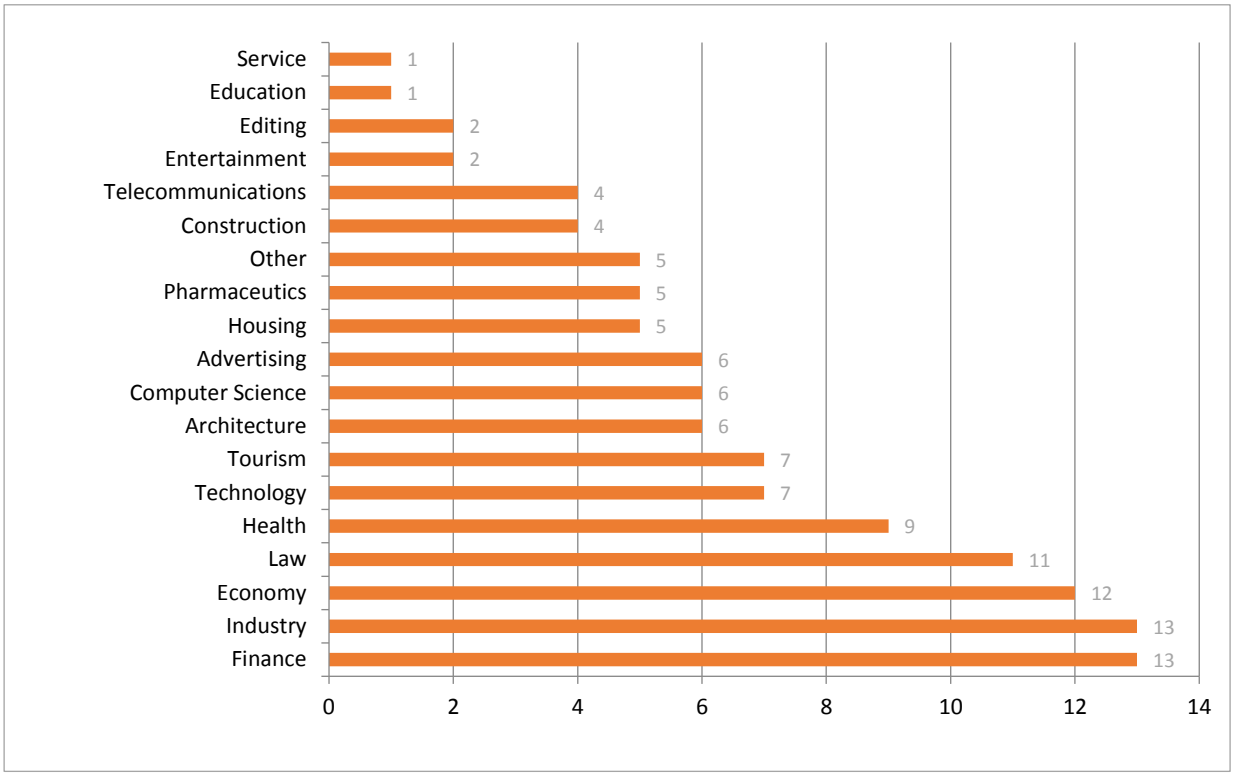

Figure 6. Clients' sectors

	Our clients do not ask for it	Our translators do not accept to work with MT output	MT systems are not reliable	MT systems do not improve productivity	The investment effort is too big	We have never considered it	Other
C	0	0	1	1	0	0	1
D	1	0	0	0	0	0	0
E	0	0	1	1	0	0	0
F	1	0	0	0	0	0	0
G	0	0	1	0	0	0	0
H	1	0	0	0	0	0	0
I	0	0	0	0	0	1	0
J	0	0	1	0	0	0	0
K	0	0	1	0	0	0	0
L	0	1	1	1	1	0	0
M	0	0	1	0	0	0	0
N	1	0	0	1	0	0	0
O	0	0	0	0	1	0	0
P	0	0	1	0	0	0	0
Total	**4**	**1**	**8**	**4**	**2**	**1**	**1**

Table 5. Reasons for not using an MT system (answered by the 12 companies that are not currently using any MT system plus the two companies that have used it in the past).

Appendix 2. Invitation to participate sent by email to Swiss-based LSPs.

UNIVERSITÉ DE GENÈVE

INVITATION À PARTICIPER

À UNE ENQUÊTE SUR L'UTILISATION DE LA TRADUCTION AUTOMATIQUE ET LA POST-ÉDITION EN SUISSE

Le Département de Traitement Informatique Multilingue de la Faculté de Traduction et d'Interprétation de l'Université de Genève souhaite réunir des informations sur la **traduction automatique** et la **post-édition** dans le marché suisse pour **établir une cartographie** et **préparer** adéquatement **ses étudiants** au marché de travail. L'enquête est réalisée dans le cadre du ProjecTA, notre partenaire dans cette initiative.

Pour ceci, nous avons besoin de votre aide. Il s'agit de répondre à un **questionnaire de 15 à 25 questions** (selon votre profil) sur l'utilisation de la traduction automatique dans votre entreprise. L'enquête est disponible en français, anglais et allemand.

TEMPS

Le questionnaire vous prendra entre **10 et 15 minutes**.

DATE LIMITE

La date limite pour répondre au questionnaire est le **15 juillet 2015**.

CARACTÈRE ANONYME ET CONFIDENTIEL DE L'ENQUÊTE

Les données recueillies pourront être utilisées à des fins scientifiques et pédagogiques, mais resteront anonymes et aucune information ne sera donnée sur l'identité des participants et des entreprises concernées.

INVITATION TO PARTICIPATE

ON A STUDY ON THE USE OF MACHINE TRANSLATION AND POST-EDITING IN SWITZERLAND

The Department of Translation Technologies at the Faculty of Translation and Interpreting of the University of Geneva is conducting a **survey** to gather information on the use of Machine Translation and Post-editing in the Swiss market. We aim at discovering the use of those practices in professional environments. Your answers will also help us to better prepare our students for the job market. This survey is conducted under the umbrella of the ProjecTa project, our research partner in this initiative.

We need your help. Our survey is made of **15 to 25 questions** (depending on your profile) on the use of machine translation in your company. The survey is available in French, English or German.

TIME

Filling the questionnaire will take you **10 to 15 minutes** approximately.

DEADLINE

We will be collecting answers until the **29th June 2015**.

CONFIDENTIAL AGREEMENT

Collected data will only be used for research and teaching purposes. Data will be anonymized, and we will not distribute any information about participants' identity nor their enterprises.

ACCÉDEZ À L'ENQUÊTE (French) | ACCESS TO THE SURVEY (English) | UMFRAGE STARTEN (Deutsch)

Nous vous remercions par avance de votre participation et nous nous réjouissons des résultats !

Thank you for your collaboration!

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Biography: Victoria Porro Rodríguez worked in the Department of Translation Technology of the University of Geneva from 2012 to 2015 as a research and teaching assistant (*assistante*) in post-editing and machine translation and actively collaborated in the EU-funded ACCEPT project. She holds a degree in Translation and Interpreting from the Universidad Autónoma de Madrid (Spain), a Master in Medical Translation (Universidad Jaume I, Spain) and a Master in Translation Technologies (University of Geneva, Switzerland). Victoria currently works as a freelance translator and consultant in translation technologies, but she still collaborates with the Department in various research projects, such as BabelDr.

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Biography: Lucía Morado Vázquez is a Research and Teaching Fellow (*maître-assistante*) at the FTI, University of Geneva, on the areas of localisation, computer-assisted translation tools and information technology. Lucía obtained a PhD in localisation at the Localisation Research Centre, University of Limerick, Ireland. She also holds a BA in translation and interpreting from the University of Salamanca. Since 2009, she has been a voting member of the XLIFF Technical Committee and the XLIFF Promotion and Liaison Subcommittee since its establishment. Lucía's research interests are standards of localisation, localisation training, translation memories' metadata and machine translation post-editing.

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Biography: Pierrette Bouillon has been Professor at the FTI, University of Geneva, since 2007. She is currently Head of the Department of Translation Technology and Vice-Dean of the FTI. She has numerous publications in computational linguistics and natural language processing, particularly within lexical semantics, speech-to-speech machine translation for limited domains and more recently pre-edition/post-edition. In the past, she participated in different EU projects and was lead for four Swiss projects in speech translation: MEDSLT 1 and 2, REGULUS and CALL-SLT 1. She is currently head of the SNF CALL-SLT 2 project and BabelDr and she has coordinated the European ACCEPT project.