An empirical study of professional translators' attitudes, use and awareness of Web 2.0 technologies, and implications for the adoption of emerging technologies and trends

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This questionnaire-based study was conducted as a part of an MA Dissertation in the summer of 2010 (Gough, 2010a). It examines the trends within the translation industry which have developed in response to the evolution of the Web from Web 1.0 (the information web) to Web 2.0 (the social web) and places professional translators against the backdrop of these trends. The developments based on the principles of sharing, openness and collaboration associated with Web 2.0 can be seen as affecting the tools used by translators and the processes in which they engage. This study examines professional translators' awareness and perception of the new open, collaborative tools and processes and the degree of tools usage and process participation. The key findings of this study highlight translators' vague awareness and insufficient understanding of these trends, marginal use of the open tools and little engagement in the collaborative processes. The underlying factor determining translators' awareness, perception and the use of these tools and processes is their attitude towards adopting new technologies, with an indication that professionals with innovative attitudes are more inclined to embrace the new trends and developments.

1. Introduction

Since the birth of the World Wide Web in the 1990s, we have witnessed a galloping "webolution" enabled by the various technological advancements in Information Technology. This webolution seems to be accelerating more and more rapidly. No sooner does a concept become widely recognised and acknowledged, than it changes, evolves or morphs into another one, causing academic research to become outdated faster than ever before. This study is focused upon Web 2.0 and the issues it presents to today's translators. It is relevant to the technological challenges of the present day; however it is cognisant of further changes from evolving new technologies, e.g., those associated with Web 3.0.

Traditionally, technology has not been perceived by translators as a vital part of the translation process, mainly because the process of linguistic

and cultural rendition has always been exclusively tied to the cognitive and creative skills, which are deemed essentially human. For this reason, as Bergman (n.d.) observes, professional translators might not generally have been associated with tech-savviness or fast adoption of trends and developments in the field of translation technology. Admittedly, the adoption of Computer Assisted Translation (CAT) technology increased in the last decade and Shuttleworth and Lagoudaki (2006) rightly point out that "translation professionals seem to have achieved a certain level of sophistication as computer users and greater familiarity with TM systems" (n.p.). However, new trends and technologies emerge faster than ever before and with the lack of empirical studies assessing the adoption of these trends and technologies by professional translators it is difficult to gauge the current status. This research has therefore been motivated to provide such evidence.

2. The significance of Web 2.0

The Internet is undoubtedly the biggest technological revolution of our time. The early Internet, now labelled Web 1.0, had a fairly static form, with books, news, music etc. being merely posted on-line in a digital format. It was akin to a one-way street. As the adoption of the Internet increased and feedback loops were formed, the evolution of technology began to encompass the two-way communication desires of the end users. The arrival of Web 2.0 applications which enabled this two-way communication (such as Wikipedia, Twitter or YouTube), encouraged active participation, allowing users not only to socialise, generate content and share ideas, but also to engage in work practices on-line, with the benefit of instant, global communication. Closer to the translation field, sites like ProZ have benefitted from the interactive features of Web 2.0 such as KudoZ network or the job posting board. No longer a narrow one-way street, the Internet has become a superfast, multilane, two-way highway. The underlying "collaborative" characteristic of Web 2.0 spawned a new generation of Internet-enabled technologies which have had a tremendous impact on the translation industry and the ensuing practices of professional translators. This impact is observable in the tools used by translators and the processes they engage in.

The major changes affecting the architecture of modern internet tools, including translation tools, are twofold. On the one hand, there is the collaboration-driven, open source movement which is affecting software applications and undermining the proprietary model, and on the other hand, there is a shift in emphasis on the value of data as opposed to the value of applications per se. The translation tools market, hitherto filled exclusively with proprietary, inflexible and expensive software has been permeated

with various open, often free of charge tools offering a greater degree of flexibility and customization. The market dominance of closed-environment desktop tools has diminished in favour of their web-based counterparts which allow collaboration, cloud-based resource sharing in real time and offer a better, XML based architecture and a higher degree of interoperability (Gough, 2010b). The underlying data-driven approach of Web 2.0 (which benefits from the abundance of data on the Internet) has not only brought about the rapid development of statistical machine translation but highlighted the issue of data sharing.[1]

Workflows, referred to in this paper as 'processes', too, have been subjected to a radical change. The traditional, sequential, Gutenberg-based TEP (translate, edit, proofread) model has been undermined by a PCTP (plan, coordinate, translate, publish) model, supercharged on today's broadband-distributed collaborative network (Beninatto & DePalma, 2007), with added steps allowing for machine translation and crowd/community contribution. Various collaborative processes enabled by Web 2.0 technologies, such as crowdsourcing and community translation, have disturbed the status quo and are changing the traditional landscape of the translation workflow. According to Garcia and Stevenson (2008, 28) these processes "are going to shake the profession in a [...] radical way". As the translation industry is undergoing dramatic changes, translation in the globalised society is emerging as a "standard feature, a ubiquitous service, [...] a basic need of human civilisation" (Van der Meer, 2011a, n.p.). Translation tools and processes are constantly adapting to these changes to fit in with our changing lifestyles, preferences and habits and to meet the growing demand for translation services. But these changes are disruptive and as such affect the human workforce of the industry the most. Professional translators are the human core of the translation industry and therefore are very likely to feel the immediate effects of such disruptive innovation. This study examines how professional translators are responding to the recent changes affecting the translation industry.

3. The questionnaire

For the purpose of this study, a questionnaire comprising of 21 questions was developed (see Appendix). It aimed to examine professional translators' awareness of the new open and collaborative tools and processes, establish to what degree translators use these tools and participate in the processes, and investigate what is their perception of these tools and processes. It also briefly examined how professional translators are adapting to the changing landscape of the translation industry.

The questionnaire was distributed in English via numerous forum groups such as LinkedIn, ProZ and Translators Cafe as well as websites (e.g., www.translatorstraining.com), newsletters (e.g., Translation

Automation User Society (TAUS)), e-mails, blogs and Twitter. It was circulated for 6 weeks, from 12 July until 22 August 2010 and yielded 224 usable responses from professional translators. Whilst 42 countries were represented, the sample was dominated by respondents from European countries (67%), with small samples from the Americas (14%), Asia (6%) and Africa (1%). 12% of respondents did not disclose their place of residence. 65% of the respondents were female, and all ages were represented in relatively equal proportions. Translators with 3-5 years of experience accounted for a third of the sample, representing the largest single group while over 50% of the respondents indicated experience in excess of 6 years (see Figure 1). The respondents were asked to classify themselves with regard to adopting new technologies. The following classification was used:

(1) Innovator/early adopter—looking for innovative solutions and picking up new technologies as soon as they emerge

(2) Fast follower—careful attitude but accepting change more quickly than the average

(3) Late majority—sceptical attitude and using new technologies when the majority are using them

(4) Traditionalist—only accepting new technologies when they have become commonplace tradition.

Almost half of the respondents declared to be fast followers and one third classified themselves as late majority.

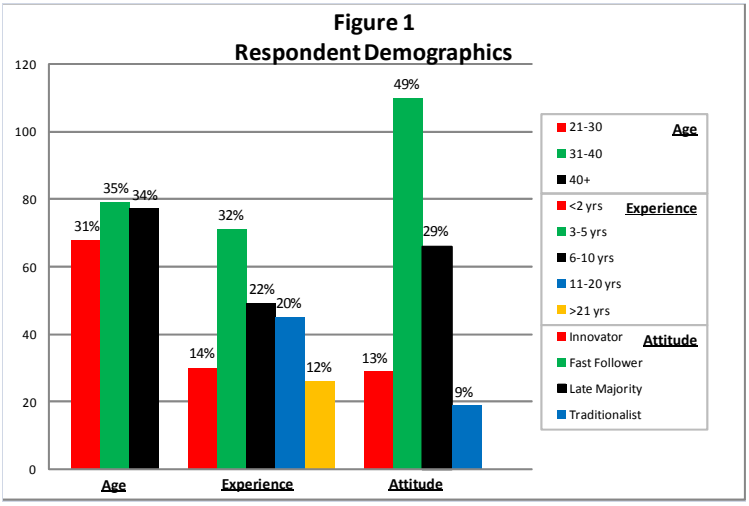

Figure 1: Respondent demographics in terms of age, experience and attitude

82% of respondents were freelancers, 20% held in-house positions, 27% worked for agencies or language service providers, 37% worked directly with clients and 12% worked in other roles.

The survey data were analysed in the subsequent sections according to the following categories *age*, *experience* and *attitude* towards adopting new technologies.

4. The results

4.1. Awareness of concepts related to Web 2.0 technologies

The respondents were asked to state the level of their familiarity with various concepts related to Web 2.0 and translation technology such as cloud computing, crowdsourcing/community translation, collaborative translation, open source collaborative translation tools, translation memory (TM) sharing, and the convergence of machine translation (MT) with TM (see legend of Figures 2a and 2b).

The results revealed that translators display a certain degree of awareness of general concepts related to the technological developments and trends, and to those pertaining to the industry. However, this awareness seems to be lacking in depth, with answers 'heard about it but don't know the details' and 'quite familiar' scoring the highest. Figure 2 illustrates the relationship between the specific concepts and the level of translators' awareness of them, with Figure 2a showing the less known concepts and Figure 2b showing concepts with which the respondents were more familiar.

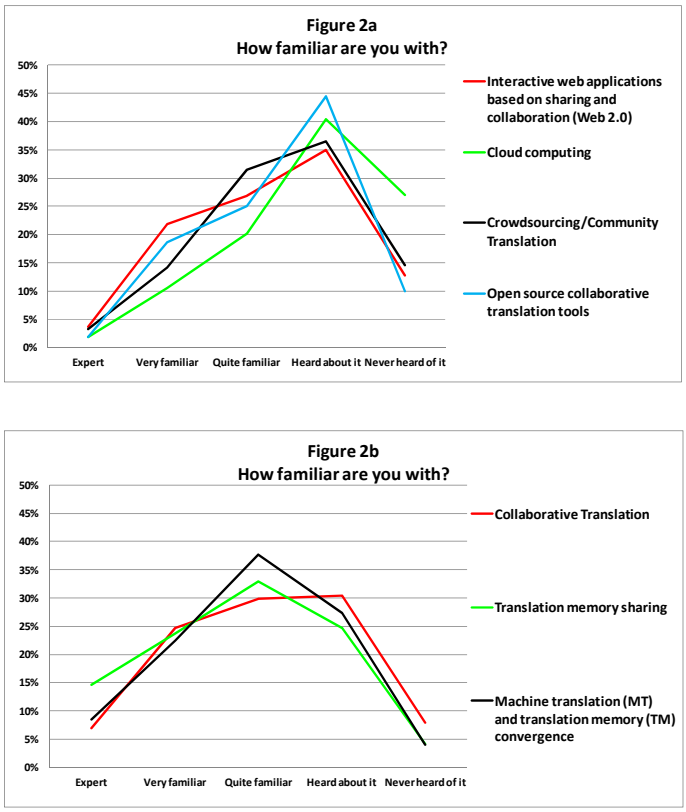

Figure 2: Awareness of concepts related to Web 2.0 and translation technology

The biggest aggregation of 'vague' awareness is displayed in relation to Web 2.0, cloud computing, crowdsourcing/community translation and open source tools (Figure 2a). Three in four respondents showed various degrees of familiarity with concepts involving TM, such as MT/TM convergence and TM sharing. Higher awareness is therefore verified in the areas linked with tools or processes translators are already using or engaging with (Figure 2b). Therefore, unsurprisingly, professional translators seem to have more awareness and knowledge about specific developments within the translation industry such as MT/TM convergence or data sharing than about the overall technology trends such as Web 2.0 or cloud computing. As an American sociologist Beniger suggests, "we may be preoccupied with specific [...] events and trends, at the risk of overlooking what only many years from now will be seen as the fundamental dynamic of our age" (Beniger, 1986, p.3). The respondents were next asked whether they keep up with the latest technological developments in the translation industry. Interestingly, only 6% declared that they do not and 62% confirmed that they keep up to some extent (see Figure 3a). Figure 3b shows that the 32% of the respondents who claim to keep abreast with the trends and developments are mostly innovators/early adopters and fast followers.

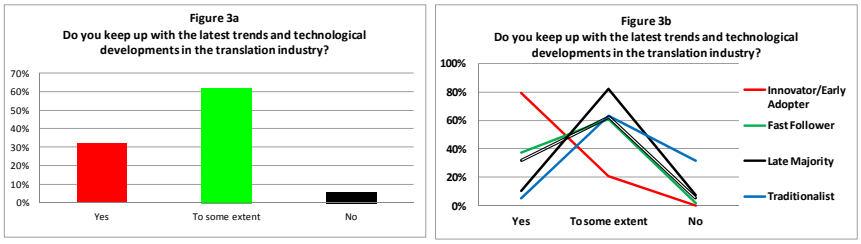

Figure 3: Keeping up with technology

3040% of the respondents who feel they keep up with the developments consider professional associations, professional literature, training, conferences, seminars and workplace to be good sources of information. However, the results show that the biggest source of information about the developments is the Internet. Nearly 70% of those who try to keep abreast with technology use discussion forums and other social media such as blogs, LinkedIn and Twitter for this purpose

The main reasons for not keeping up with technological developments were financial constraints, the lack of time, and the lack of need (56, 37 and 30% respectively for all respondents—for range of choices provided see question 9 of the questionnaire). 27% of the respondents feel that keeping up with these developments is too difficult from technological point of view or that training takes too much effort. Interestingly, although

only 6% of the respondents admit to not keeping abreast with developments, 95% have given reasons why they don't. This could mean that although the majority of the sampled translators try to keep up with the technological developments, in reality, there are too many constraints hindering them from doing so. This would explain the discrepancy found between the relatively high numbers of translators declaring that they keep up with the developments and the relatively low levels of awareness and uptake.

When analysing data in search of a "profile" of translators who display the greatest awareness of the latest developments in the field of translation technology, it transpired that age was not a determining factor (Figure 4a). Experience played an influential role in the case of translators who practiced for less than two years, as discussed later. However, it became clear that attitude towards technology was the biggest differentiator. The Figures 4a and 4b below illustrate this.

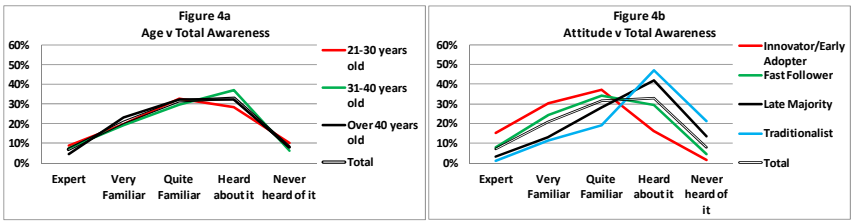

Figure 4: Awareness of Web 2.0 technology related concepts as affected by age and attitude[2]

The respondents who self-proclaim to be innovators or early adopters are clearly the most familiar with the latest developments, followed by fast followers, late majority and traditionalists. Therefore, it would transpire that the more pro-active and positive attitude towards technology, the more acute awareness of the trends and developments within the industry.

An interesting observation can be made in relation to experience affecting technology awareness. The least experienced translators showed the least awareness, which would imply that knowledge about the developments comes from practical experience, and not necessarily from current education. On average, 40% of translators coming fresh to the market with the benefit of having just completed their courses are unaware or vaguely aware of the developments within the translation industry despite 80% of them holding Masters or PhDs (see Figure 5). For further reading regarding the issues of translator education/training and the industry see Gough (2010c).

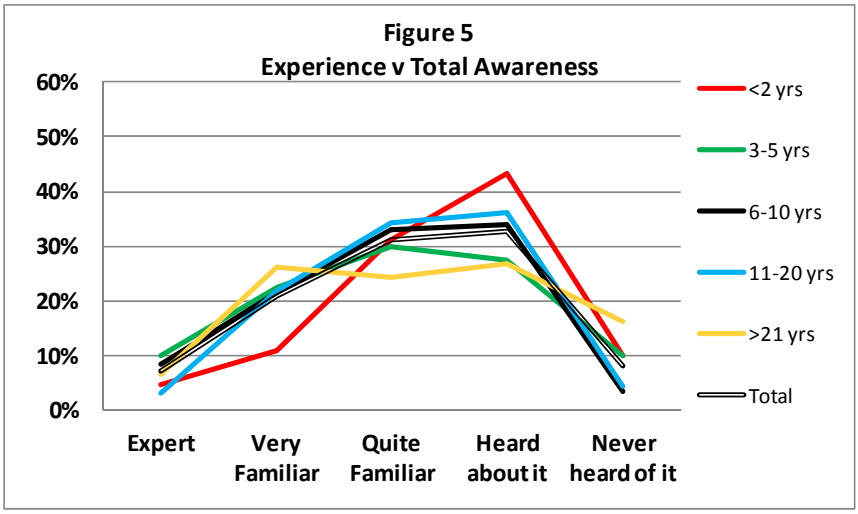

Figure 5: Familiarity with web 2.0 technology related concepts as affected by experience

The translation industry is on the cusp of a powerful transitional change and as Vashee (2010, n.p.) observes,[3] "larger forces that are driving structural changes are an observable fact of the translation landscape today". This transformation has global roots, but manifests itself on different levels such as social practices involving translation (e.g., crowdsourcing or community translation) or on the level of translation technology. The relatively low levels of awareness of the recent trends might indicate that the realisation of what this change means and entails and an understanding of what it might bring to the world of professional translators has not been fully realised, and the impact has not yet been felt by translators responding to this survey.

4.2. Use of tools and processes

4.2.1. Use of tools

The findings of this study reveal that over 80% of surveyed translators are using proprietary CAT Tools, with three out of four using them on a regular basis. Open tools (including open source translation tools such as Omega T[4] and various open translation or sharing platforms such as TAUS search (TAUS Data Association)[5], MyMemory,[6] Worldwide Lexicon[7] or Open

TM2)[8] are used by 25% of the respondents, with 6% using them on a regular basis. Interestingly, despite the low current usage of open tools, 75% of translators taking part in this survey expressed a likelihood of using open tools in the future. This corresponds to the 'awareness score' for open tools, which was highest by far on the 'vague awareness' point (see Figure 2a).

As in the case of translators' familiarity with technology concepts, attitude seems to be the most discernible factor when it comes to the use of tools in general. The same pattern was observed for both proprietary and open tools with regard to attitude. In both cases the biggest users were innovators, followed by fast followers, late majority and traditionalists respectively. Traditionalists stand out with nearly 70% not using proprietary CAT Tools at all and only 2% using open tools, as shown on Figures 6a and 6b below.

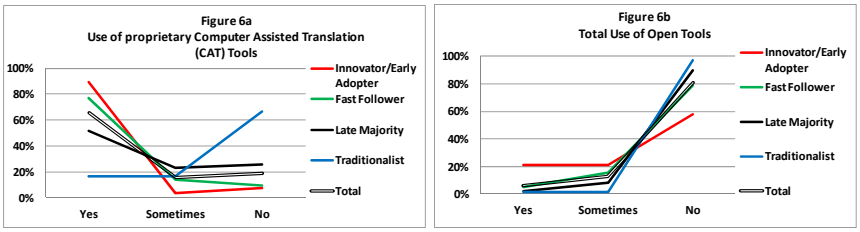

Figure 6: The use of proprietary and open tools as affected by attitude

Data gathered in this study corroborates a rational principle whereby the more readily people adopt new technologies and follow technological developments, the more tools they use and the greater the variety of software they tend to explore. Therefore, translators with innovative attitudes towards technology will naturally seek to explore alternatives to standard solutions more enthusiastically than translators with more conservative approaches.

4.2.2. Participation in processes

With regard to involvement in crowdsourcing or community translation, it was empirically shown that 12% of professional translators are contributing to these collaborative processes today. However, there is an indication that participation might increase, with nearly 40% of respondents declaring they would consider getting involved in the future.

The degree of participation seems to be affected by all three factors – age, experience and attitude (see Figures 7a, 7b and 7c respectively). There is an indication that in future the collaborative processes are likely to attract younger translators with little experience, possibly as an opportunity to

practice newly acquired skills or self-promote their services. Attitude seems to affect the involvement in these processes, with four times more innovators taking part than even fast followers. The Figure 7c below illustrates this.

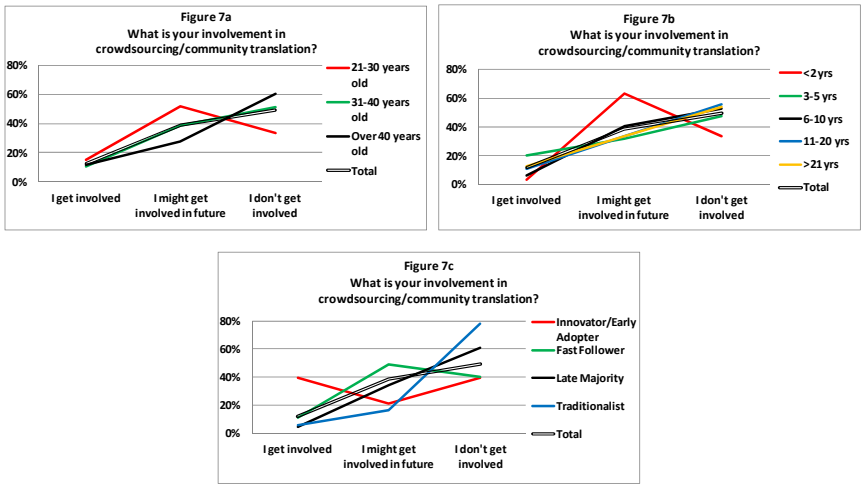

Figure 7: Collaborative processes as affected by age, experience and attitude

To summarise, the survey results suggest that so far the new tools and processes have only been embraced by professional translators with the most innovative attitudes; however there is a strong indication that a greater number of translators might be using the open tools and intending to participate in the collaborative processes in the future.

4.3. Perception of tools and processes

The respondents were asked whether their work practice had changed in the last few years due to advancements in technology. Nearly half of the respondents admitted that their work practice had changed significantly and a quarter reported that it changed dramatically. Only 3.6% of the respondents did not notice any change (see Figure 8).

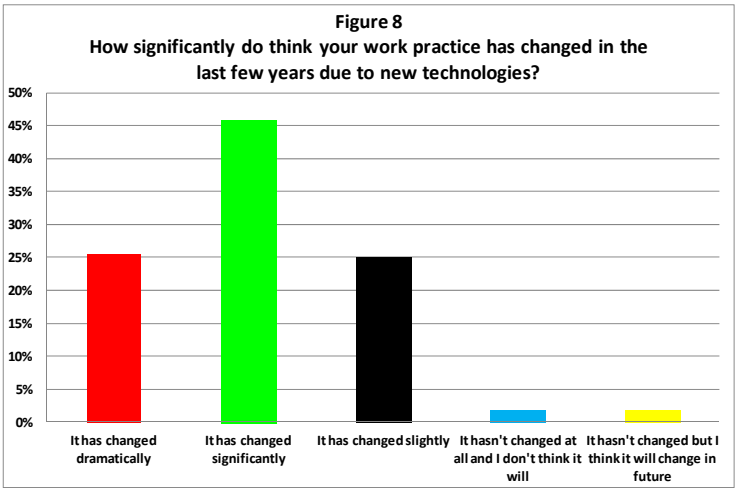

Figure 8: Change in work practices in the last few years due to new technology

Whilst it transpires that the majority of surveyed translators have felt the impact of new technologies on their work practices, the opinions regarding these technologies seem to be either divided or not yet fully formed, as illustrated in the following sections.

4.3.1. Perception of tools

TM sharing is a relatively well known concept, with 70% of the respondents displaying various degrees of familiarity. When asked about the potential benefits of sharing translation memories, opinions were mostly divided between 'agree' and 'no opinion' (see Figures 9a, 9c & 9e). However, when considering TM sharing as a potential threat, translators were almost equally divided between those who agree, disagree and have no opinion, which would point to the fact that the benefits of sharing are thought to outweigh the threat (see Figures 9b, 9d, 9f). Interestingly, translators with the most experience display the highest levels of 'no opinion'.

It could therefore be concluded that although professional translators are starting to recognize the potential of sharing their linguistic resources, confirmed by the very low rate of 'disagree' responses, they seem to be divided on the subject of sharing. On average, 30% of the respondents are willing to share and recognise the fact that they can benefit from having access to translation memories of other translators (see Figures 9a, 9c and 9e). The remaining respondents either feel uncomfortable about freeing

their assets and are inhibited by the fear of losing competitive advantage or hold no view at all (see Figures 9b, 9d and 9f below).

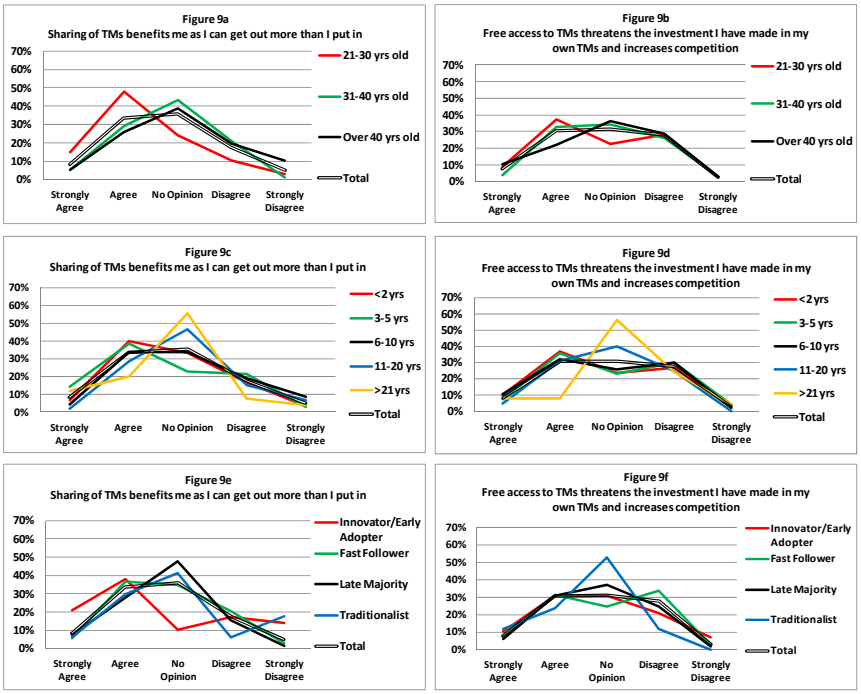

Figure 9: Positive and negative aspects of TM sharing as affected by age, experience and attitude

With regard to the collaborative tools, the respondents' perception seems to tally with their awareness of these tools. Since over half of the respondents do not have much knowledge of the open tools, there is a strong presence of 'no opinion' regarding these tools, especially amongst the more mature translators displaying conservative attitudes towards technology (see Figures 10a, 10b, 10c, 10d, 10e and 10f).

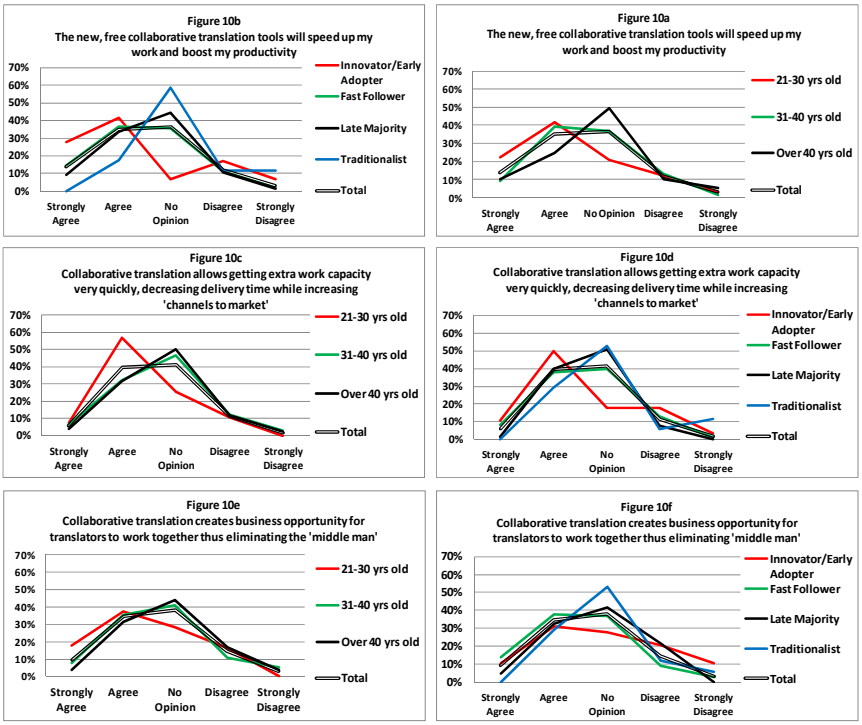

Figure 10: Perception of collaborative tools as affected by age and attitude towards technology

However, on average, the total number of translators in agreement is much higher than those in disagreement, which seems to point to the fact that the alternative, collaborative translation workflows might be gaining popularity.

To summarise, it is clear that with regards to the perception of collaborative tools, the younger translators generally hold stronger opinions, whether positive or negative, and there is a significant perception gap between traditionalists and innovators. However, despite the apparent, overall division between agreement and no opinion, there seems to be no vehement opposition or any discernible critique of the collaborative tools. This most likely stems from the respondents' insufficient knowledge or awarenss of these tools, thus preventing them from forming an educated opinion. Professional translators with innovative attitudes seem to be more readilly attracted to the open tools, which tallies with their higher knowledge of these tools.

4.3.2. Perception of processes

The concepts of crowdsourcing and community translation seem to be the least known of all the concepts examined in this study (see Figure 2b); however, they attract relatively strong opinions.

Respondents were asked to give an opinion to statements reflecting negative and positive aspects of the collaborative processes, as listed in the legend of the Figure 11 below.

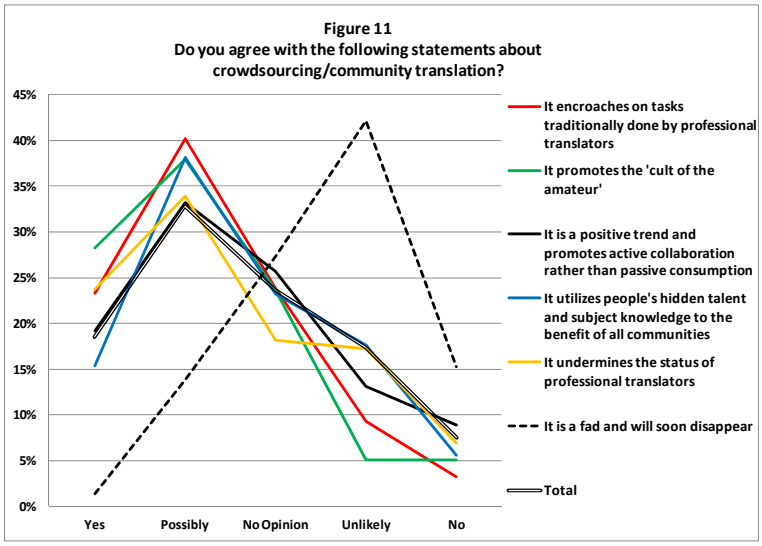

Figure 11: Perception of the collaborative processes – positive and negative aspects

On average, 50-60% percent of the respondents are in an agreement with both the positive and the negative statements (15-28% saying 'yes', and 33-40% 'possibly'). This could mean that, as in the case of TM sharing (Figure 9), professional translators seem to recognise the social values of these trends, such as utilizing people's hidden talents or promoting active collaboration rather than passive consumption. However, on a personal level they might feel threatened by them as they might undermine their professional status or encroach on tasks traditionally done exclusively by professional translators. Nonetheless, taking into account that only a small percentage of the respondents were actually familiar with the concepts of crowdsourcing/community translation (see Figure 2a) and only 12% of the surveyed translators actually participate in these initiatives, it would appear that these opinions might not necessarily be based on an informed perspective.

Rather interestingly, the only question that prominently stands out is the one concerning the future of collaborative processes. The majority of the respondents agreed that the collaborative processes in the form of crowdsourcing or community translation are not a fad and are here to stay. When analysing questions related to the various aspects of collaborative tools and processes (such as productivity, scalability, delivery time, channels to market, creativity or innovation) against the age, experience and attitude of the respondents, there appears to be a consistent pattern. Innovators and fast followers seem to outnumber late majority and traditionalists in recognising that collaboration with other translators through open tools could bring potential benefits (see Figures 10b, 10d & 10f).

An interesting result emerged with regards to the effectiveness of quality assurance based on peer-review, which is used in a typical voting system in the collaborative models of translation such as crowdsourcing or community translation, but would make perfect sense in the case of collaborative translation between language professionals. There seems to be almost unanimous agreement to this question, indicating a high potential for more collaborative translation patterns to emerge in the future, with peer-review being an important component of this kind of process.

Figure 12: Perception of the effectiveness of quality assurance based on peer review as affected by age, experience and attitude

To summarise, with the exception of the young innovators, there seems to be an absence of opinions regarding the open tools and collaborative processes or, if present, they appear to be based on insufficient knowledge. This perhaps reveals a rift between professional translators' appreciation of

the benefits these new technologies and their applications can bring, and apprehension caused by lack of knowledge.

4.4. Future

When asked about the possible ways of adapting to the changing nature of their work, professional translators who responded to this survey generally expressed willingness to re-position themselves, with only 20% declaring they would leave the industry. The most interesting finding points to the fact that 85% of the respondents would prefer to adapt using conservative ways such as specialising or changing position within the current establishment (see Figure 13). Only a small percentage would look into innovative solutions such as crowdsourcing and, unsurprisingly, the majority of the respondents who chose this option had labelled themselves as innovators and fast followers.

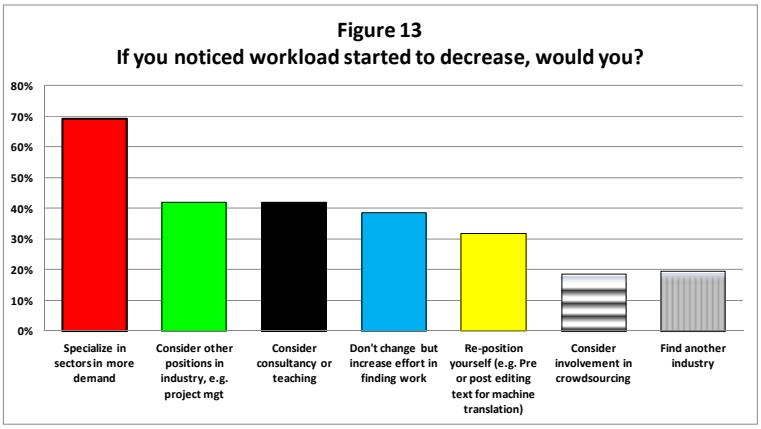

Figure 13: Future alternatives for professional translators

With regard to the relationship between translators and the industry, the main finding revealed that 59% of the respondents feel that professional translators are not being educated about the changing nature of the industry and about the possible ways of adapting to the new challenges of the market.

4.5. Openness, sharing and collaboration

Professional translators were asked whether they subscribe to the latest trends of sharing, openness and collaboration. Currently 26% of the

sampled translators subscribe to these trends; however, over half of the respondents declare that they might do in future. The results unambiguously show that openness to these trends does not depend much on age or experience (see Figures 14a and 14b), although the youngest translators do seem to have a much higher rate of future commitment than the more mature ones. However, the most important finding points to the fact that it is the attitude towards technology that determines to what extent translators embrace these trends (see Figure 14c).

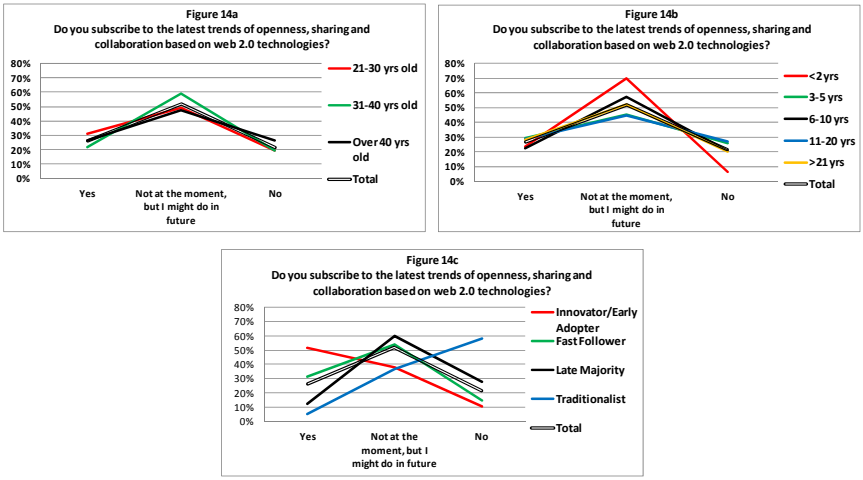

Figure 14: Openness towards the trends of oppenness, sharing and collaboration as affected by age, experience and attitude

5. Conclusion

This study, undoubtedly, is bound by certain limitations. Capturing a representative picture of professional translators' awareness, usage and perception of the new technological trends proves extremely difficult given the fragmented nature of the translation industry, the limitations of the chosen method, as well as a perceived general lack of time, enthusiasm or interest on behalf of some professional translators with regard to participating in surveys, especially ones carried out by students.[9] The sample was largely dominated by respondents from European countries and due to the fact that the questionnaire was primarily administered through various on-line media, it is likely that it would have attracted translators who are frequent Internet users, and therefore could have potentially been more technology aware. Also, the fact that the questionnaire was circulated only in English would have prohibited non-English speakers from

contributing. During the time the questionnaire was circulated, another limitation was pointed out, mainly the fact that the age groups were not well represented, especially at the both ends of the spectrum. Subsequently, since there were no respondents under 20 years old, this category was dropped during the analysis.

The findings of this study demonstrate that professional translators responding to this questionnaire have neither fully grasped the driving concepts behind the Web 2.0 nor embraced the technology that employs these ideas and depends on them. The concepts of openness, sharing and collaboration and their utilization through translation tools and processes remain in the realm of varied, mostly vague awareness, resulting in marginal use of the open tools, little engagement in the processes and reluctance to adapt to the new reality through innovation. This seems to imply that the changes are happening to translators rather than with translators. Gouadec (2007) observes:

> information technology and dedicated applications are now having a major impact on the profession, and are beginning to create a rift between those who are able and willing to make full use of the resources available, and those who are not. (p. 279)

Multilingual communication is now an instant, global phenomenon and translation is often only one part of a larger, information management workflow. According to Garcia and Stevenson (2008, p.28), "translation is about the only obstacle left in the way, and accordingly translators will be among the first to feel the effects as the planet tries to dismantle Babel and reach a universal 'dialogue continuum'".

Translators are a part of the translation industry's eco-system where the same rules of nature apply to all its organs. Automation and collaborative approaches are often perceived by professional translators as threatening and phrases such as 'eat or be eaten' (TAUS: online) or 'collaborate or perish' (Schmidt, 2009: online) found in the recent industry discourse point to this threat. Although the extinction of professional translators is not predicted any time soon, their role within the eco-system could be weakened or, possibly, they might be left to perform only highly specialised functions. The relatively slow uptake of trends and technology by professional translators and the possible difficulties in seeing the potential opportunities that technology might bring could greatly contribute to this diminished role of professional translators in the future.

One of the key findings of this study is the fact that the underlying factor determining translators' awareness, perception and use of tools and processes is their attitude towards adopting new technologies, with an indication that the professionals with less experience and innovative attitudes are more inclined to embrace the new open tools and collaborative processes. On the other hand, the results show that formal education and

training are not necessarily the source of awareness and knowledge about the recent issues and trends with nearly 60% of the sampled translators feeling they are not being educated or informed about the changing nature of the industry and the possible ways of adapting to the new challenges of the market.

If attitude is the X-factor which determines translators' alignment with the latest trends and willingness to embrace them, then this factor can be promoted, fostered and cultivated to enable translators to actively engage in the affairs of their industry, rather than feeling that they are sidelined, threatened and exploited.

In order to achieve this, the translation industry needs to feed the latest trends into the education system as soon as they become apparent to facilitate a more comprehensive training of translators and to present them with a realistic view of the industry and career possibilities. On the other hand, the education system should embrace these trends quickly and provide future-oriented courses with the relevant technology modules built in into their existing programmes. Furthermore, an open dialogue between the industry, professional translators and educational bodies would be advantageous for the benefit of all concerned with the future of the translation industry.

In the meantime, a new 'layer' of more sophisticated and far-reaching technology associated with Web 3.0, which could have an even bigger impact on the shape of future translation processes and indeed, the technological infrastructure supporting them, is already permeating the Internet.[10] Although there are indications that professional translators might draw nearer to the full understanding and participation in the technological offerings of Web 2.0 in the future, the speed with which Web 3.0 is approaching would suggest that it could be even more difficult to catch up with the developments in the future.

Sociologists Brinkerhoff, White, Ortega and Weitz (2008, p. 378) argue that "technology defines the limits of what a society can do [and therefore] technological innovation is a major impetus for social change". They go on to say that "currently, new technologies are developing to meet new needs created by a changing culture and society [resulting in a] never ending cycle in which social change both causes and results from new technology" (ibid). As the development of tools naturally determines/influences the processes within which these tools are used, it would appear that social change is the underlying cause driving both technology and process advancement and that these advancements/new capabilities may indeed influence the next step in social change. The rate of trends and technology adoption by professional translators might be an indicator of the pace of the social change within the community of professional translators.

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[1] Statistical Machine Translation relies on a statistical analysis of large amount of parallel bilingual data as opposed to sets of language-specific rules which form the core of Rule Based Machine Translation.

[2] Total awareness refers to an aggregated awareness of all the concepts listed in the legend of Figures 2a and 2b

[3] The driving factors behind this change could be summarized as:

- a change in the way we communicate - the shift from Web 1.0 to Web 2.0 technology which enabled great advancements in global communication and collaboration (Gough, 2010a)
- a change in the amount of information consumed by people - the increased, general demand for knowledge and information (which in America has grown 6% per year in the last 28 years, adding up to a 350% increase over 28 years (Bohn, R.E. & Short, J.E., 2009: online))
- a change in the amount of information produced for our consumption and the pace of the delivery of this information - the increased volume of content to be translated and pressures to deliver in shorter timescales (Garcia, 2009: online)
- a change in nature and formats of this content, especially on the Web - dynamic content requiring constant updating in a variety of formats (Van der Meer, 2011: online)
- a change in translation technology as a result of the above pressures - stress on value of data, opening up of the resources, increased automation (Gough, 2010a; Garcia, 2009: online)
- a change in the working patterns as a result of the above pressures - alternative, collaborative workflows, often involving non-professionals (Garcia 2009: online).

[4] http://www.omegat.org/en/omegat.html

[5] http://www.tausdata.org

[6] http://mymemory.translated.net

[7] http://www.worldwidelexicon.org/home

[8] http://www.opentm2.org

[9] This observation has been made on the basis of discussions which accompanied the survey online, as well as the ratio of the number of people viewing the questionnaire versus the number of respondents. For discussions see: http://www.linkedin.com/groupItem?view=&gid=145268&type=member&item=24916093&trk=group_search_item_list-0-b-ttl&goback=%2Egna_145268

http://www.proz.com/forum/off_topic/176524-why_do_we_hate_questionnaires-page2.html

[10] Web 3.0, also called the Semantic Web, is a solution for enriching the information on the Web with a new 'semantic layer'. This new Web 'dimension' is created by linking up entities on the Web in terms of their relationships and properties, so that computer applications can understand not only the syntactic, but also the semantic layer of the information contained on the Web pages. At present, the Web contains countless documents contained in about trillion pages, but computers cannot 'understand' this content and intensive human processing is needed to find the most relevant information. The Semantic Web will alleviate this problem by enabling the so called 'intelligent agents' to search for, gather, process or transform data in a meaningful and useful way by following the links established within the semantic layer. This will open up endless possibilities for technology to evolve towards more intelligent systems and certainly will have direct implications for language technologies, including translation.